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East Europe Report

SCIENTIFIC AFFAIRS

No. 772

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CONTENTS

STATE OF NATIONAL LASER DEVELOPMENT

Sofia OTECHESTVO in Bulgarian No 2, Jan 83 pp 26-27

[Article by Engineer Asen Milchev: "Bulgarian Laser Technologies"]

[Text] Time Flies...

No more than 2 decades have gone by since Soviet Academicians Nikolay Basov and Aleksandr Prekhorov and, at the same time, the American scientist Charles Townes created the first quantum generator radiating a powerful light beam. They named it an "optical maser" or "laser." This took place in 1960. Ten years later, the three discoverers were awarded the Nobel Prize in social recognition of the importance of their achievement.

Today no one is surprised at the word "laser" (the English acronym for "light amplification by stimulated emission of radiation"), the principle of which is familiar even to school students. Let us take as an example the best known optical generator, the ruby laser. It consists of a bit of synthetic ruby, under 1 centimeter in diameter, 10-40 centimeters long. A spiral pipe is coiled around it, which plays the role of a lamp. When it is turned on, the "stimulated emission" excites the electrons which orbit around the ruby's atomic nuclei. Leaping from one orbit to another, they absorb and then release energy-light the wavelength of which is precisely determined, i.e., it has a specific color. The laser generates a monochromatic light. In the case of the ruby it is red and is 1 million times stronger than the intensity of red light in the solar spectrum. The radiation is visible to the naked eye at a 40-kilometer distance. Another property of the laser beams is their coherence: the light waves follow one another as in a choppy sea.

You probably remember the way the unusual properties of laser light were used to determine with accuracy the distance to the Moon. Naturally, in addition to the ruby, many other lasers exist, based on a main generating solid, liquid or gaseous substance. Their field of application is expanding with every passing day...

It was only quite recently that we entered with awe the exhibition halls in which the first Bulgarian lasers built by enthusiasts from the Kliment Okhridski Sofia University and the Lenin VMEI [Higher Machine-Electrical Institute] were displayed, looking stern and strange. Students from the

Burgas Okrug Young Technicians School were enjoying their gold badges earned at the national TNTM [Movement for Youth Technical and Scientific Creativity] reviews for the optical generator they had deviced. Today, some of these same students have developed into famous Bulgarian specialists in laser technology. In no more than a few years they made a qualitative leap in the development of this exclusively interesting and promising field of optics.

Where To Look For Change?

As we know, the discovery of a new labor tool does not automatically lead to the development of a new technology. Technology is the product of the historical creativity of thousands of people. It is a tremendous accumulation of knowledge, experience and innovation, materialized in productive capital. Generations of foremen, scientists, engineers and workers have made their contributions to the multisectorial building of any new technology, which they continue to build persistently and steadily.

The day the laser beam put a hole in a shaving blade for the first time, the press enthusiastically reported the birth of a new laser technology. This was somewhat premature, for the only new thing here was the tool for the new technology -- the laser beam, focused in such a way that high temperatures could develop under its wedge. Happily, however, the popularizers of scientific progress were not too mistaken. Since today science and technology are advancing at an incredibly fast pace, it took very little time for laser technologies to appear. The most pleasing feature in this case is that Bulgarian specialists as well have been able to keep up with these giant steps. In slightly more than a decade since the creation of the first Bulgarian laser corresponding laser technologies were developed.

"Tangra 101" is the name given to an instrument developed at the Optical Scientific Research Institute of the Metalkhim DSO [State Economic Trust] in Sofia, on the basis of its own solid-state pulse laser which generates invisible infrared light. It is used in drilling high-precision miniature holes (0.05-0.2 mm) in ferrous and nonferrous metals and in processing hard substances such as agates, rubies, sapphires and quartz. Essentially, "Tangra 101" offers a general-purpose technology for microwelding, fine metal cutting, fabric cutting, etc. (With this technology the time-piece plants in the Soviet Union have reduced production defects from 50-60 percent to a minimum). A particularly valuable feature of the new development is that it is being manufactured on the basis of its own design developed by the institute's specialists in accordance with modern ergonomic requirements.

The Optical Scientific Research Institute is also offering a laser technological system for projecting images on thin covers with a 5-mm maximal graphic diameter and 0.04 mm-thick letters, figures and signs. How is this done?

The desired inscription is cut out on a template which is exposed to a laser beam of the same type of infrared optical generators and is projected through an optical system on a glass support covered with a thin film of chromium. The chromium becomes oxidized by the laser, forming a protective lining which is preserved after suitable treatment. The new laser graphic projection

technology has replaced the old expensive, labor-consuming and lengthy lithographic method which required the use of imported photographic emulsion.

Despite the growing popularity of lasers the possibilities offered by laser technology remains insufficiently well studied by our production enterprises. Yet in addition to meeting the requirements of its own trust, the Optical Institute of the Metalkhim DSO could produce laser instruments for other consumers as well. For example, during last year's Plovdiv fair representatives of Elprom in Troyan and the Lyulin Automotive Vehicle Repairs Plant in Sukhodol (Sofia) enthusiastically reacted to laser drilling technology, which proved to be the most suitable in resolving their production problems.

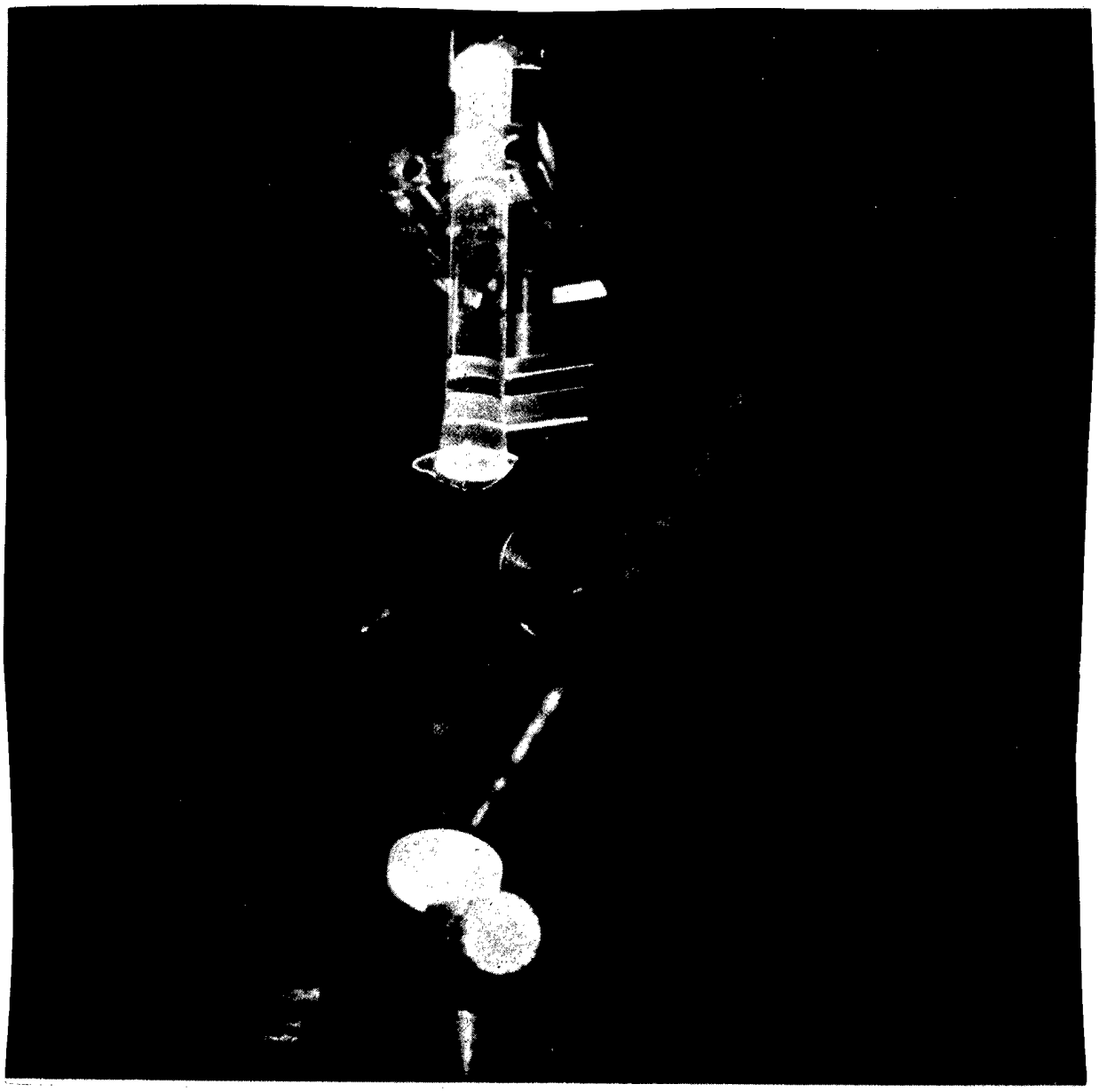
The Varna-West Port is expecting a homing laser beam with an exceptionally strong capacity to cut through fog, made by the institute. It is based on a mercury-vapor laser radiating a green or yellow color. The same type laser is being used in an area in which there have been achievements exclusively in the USSR and the United States. The development has reached the "preliminary production" stage. It is protected by an authorship certificate and has been rated "superior to world standards." It applies to the use of this type of laser in neurosurgery, physiotherapy, oncology (in the treatment of skin cancer), etc.

Gas lasers operating on a continuous mode have a very broad field of action. For example, they can be used in the manufacturing of hybrid integral electronic circuits. As we know, their resistors consist of a stratum laid on a ceramic base. Should their resistance have to be increased for structural considerations, a cut-out is made. A fully automated laser system can carry out such an operation with a less than 1 percent margin of error.

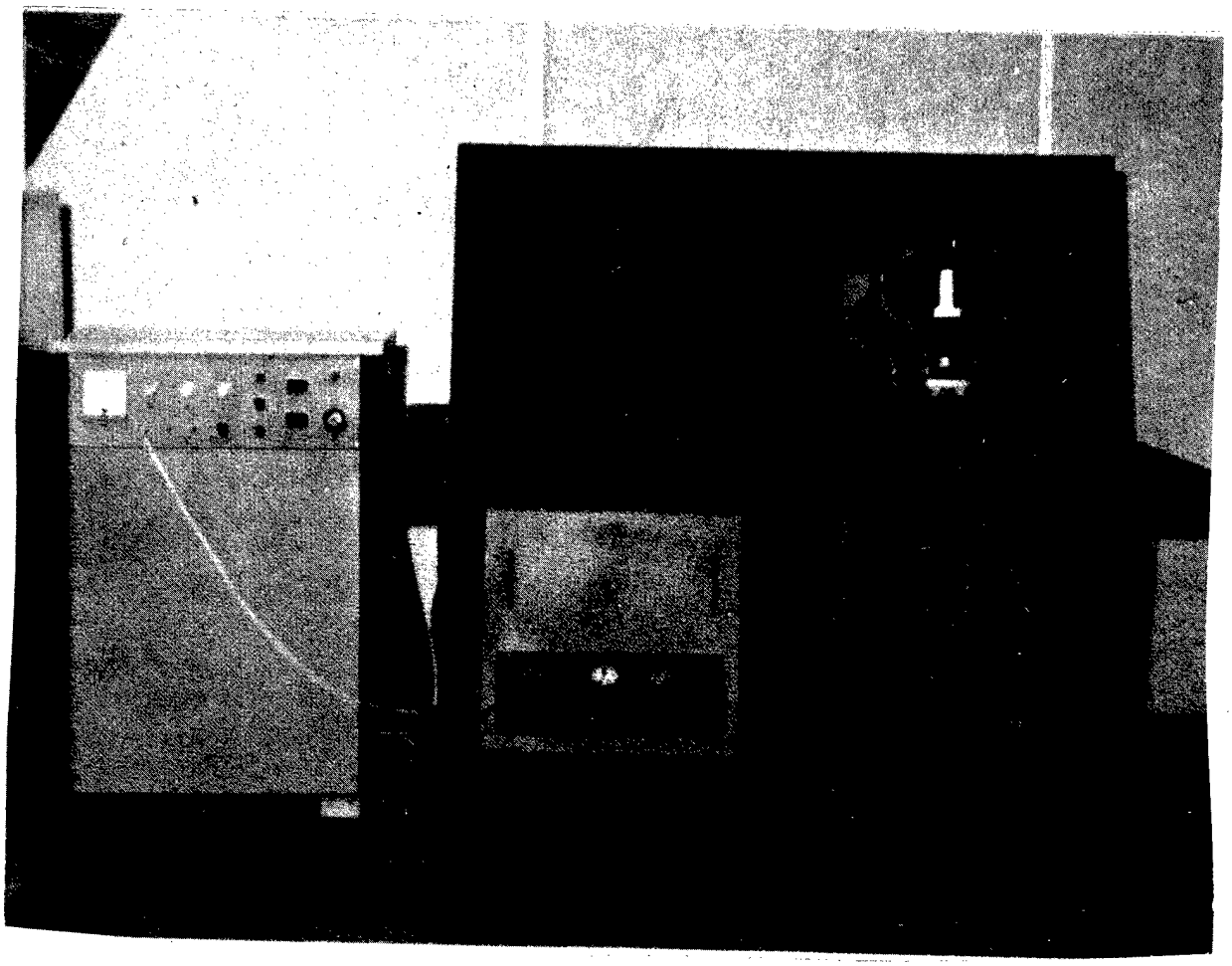
Has the time not come for our enterprises to show greater interest in the possibilities of low-power helium-neon gas lasers developed by the Optical Institute? They can be used in tuning optical systems, construction (laser level indicator and plumb line), machine building, etc.

The institute has considered agriculture as well. A helium-neon system for the pre-sowing treatment of seeds improves their germination and speeds up their growth.

The Optical Scientific Research Institute of the Metalkhim DSO is steadily creating new types of lasers and new laser instruments and technologies. As we have seen, a large number of them are already past the experimental stage and in production. Generally speaking, the preliminary research stage for optical generators seems to be drawing to an end. Lasers and laser systems are developing as a new promising direction in our instrument manufacturing. This must be realized and utilized by the interested parties.



Ion-argon laser



"Tangra 101" -- an instrument developed at the Optical Scientific Research Institute of the Metalkhim DSO

5003
CSO: 2202/6

MINISTER VIEWS ELECTRONICS INDUSTRY

Bratislava NOVE SLOVO in Slovak 13 Jan 83 p 8

[Article by Prof Eng Milan Kubat, DSc, minister of CSSR electrotechnical industry: "On the Path to Electronization"]

[Text] In mid-1980 the weekly NOVE SLOVO published an extensive article about the tasks of the then newly established branch of the electrotechnical industry. More than 2 years have elapsed since that time and both specialists and the public are justified in asking what we have managed to accomplish in implementation of the stipulated goals. The program of electronization of the national economy is a big bite to swallow. Very few among us would tend to expect that it could be solved from one year to another. However, that does not mean that this realization would entitle us to waste time unnecessarily. Thanks to the selfless efforts of workers, technicians and leading administrative personnel over almost 3 years, we have managed to accomplish a number of specific tasks.

Key emphasis was placed from the very beginning on developing a spare-parts base and today we have at our disposal, together with the spare parts provided in the CEMA framework, the basic assortment required for final production. Serial production was launched in the case of the 8080 A microprocessor and currently under development is another type, the 16-bit 8086 microprocessor. Expansion occurred also in the assortment of semiconductor memories by RAM types and development was completed by launching the production of the initial 12 types of digital integrated circuits and circuits for consumer electronics. We also implemented measures designed to improve the quality of spare parts which made it possible to expand systems with improved reliability by digital integrated Schottky circuits. Further development is oriented toward logic circuits with reduced power consumption, higher operational speeds and toward converters.

We also managed to acquire some new types of discrete parts. An example is a top-quality transistor for channel selectors of television receivers. Very good results are also being obtained in the area of semiconductor microwave parts, wherein the level is comparable to that of the industrially most advanced countries. Much the same can be said of hybrid integrated circuits where we created the prerequisistes for improved meeting of the needs of the national economy. Concurrently with development of technology for production

of microelectronic parts we are also dealing with providing the requisite metrological and technological instrumentation. It is good to see that production of this equipment in the sector is being launched by other organizations than just TESLA Elstroj, among them VUMA [Research Institute for Mechanization and Automation] in Nove Mesto on the Vah River.

A specific area to be dealt with in implementing our program for development of the spare parts base is its material base. We need hundreds of special materials with new properties. It involves materials that are already known, but which are needed in unprecedented purity and modifications, as well as materials that are rather new, never before used in our industry. The common problem is that it almost always involves, as a rule, production of a small quantity with a high degree of enhancing of basic materials. In many respects, we are coping with this problem at the present through cooperation with other socialist countries, but there still remains a considerable number of items which we must import at a high cost. Readers of NOVE SLOVO are not unfamiliar with these problems since they were analyzed in detail and at a high professional level. (In the article "The Invisible Became Visible" of 15 October 81.)

Viable development of the spare-parts base depends on supplies from nonferrous and ferrous metallurgy, organic and inorganic chemistry, from the glass industry and other fields. It is my estimate that for development of electronics we must provide approximately 2,000 basic types of materials, at least 700-800 of which we should be able to provide in the CSSR. And that is as much to meet our own demand as it is for exchanging the assortment with other CEMA countries. Despite the fact that we are forced to provide certain chemicals, plastics, bitumens, metallic and semiconductive materials ourselves in our own area of jurisdiction, we are now and shall remain dependent in the future also on other sectors.

It appears imperative to solve even during the current 5-year plan problems relevant to providing the needed materials in the requisite amounts and quality at the level of the Federal Ministry of Metallurgy and Heavy Machinery and the CSR and SSR ministries of industry.

Pricing to Aid New Products

Another problem currently dealt with is adjustment of prices in the spare-parts base. Our goal in this area is to achieve more effective production of final products for both domestic consumption and exports. In adjusting prices, we put key emphasis on implementing correct price relations from the viewpoint of technical specifications, foreign prices and compatibility of viable assortment groups for exports. Assessment of the utilitarian properties of products in the spare-parts base must be undertaken in a differentiated manner. We adopted the principle that prices of obsolescent and nonviable products will not be lowered but, on the contrary, increased. On the other hand, in the case of new, viable products, prices will be substantially decreased depending on the level of costs and their potential reduction. This goal is designed to promote a switch by consumers to more

viable products offering technical and price advantages. Another factor in differentiation of prices between individual sectors of the spare parts base is, as can be readily understood, the attained level of return on investment and dynamics of production.

All of these aspects found application also in implementation of the price development plan for spare parts for the year 1983. Wholesale prices of electronic products will be decreased as of 1983 by an average of 9.5 percent; the reduction in 1983 will be more pronounced in the case of semiconductor elements, namely by 34.7 percent. Wholesale prices of viable microelectronic elements will be cut 40 percent.

The price level of products in the spare-parts base is in limiting factor for effective development of other industrial sectors and it will receive maximum attention even during determination of preliminary price limits in the stage of technical development of products and during pricing of new products.

Another measure designed to promote development of production and consumption of modern microelectronic parts is using the system of dual prices the essence of which is constituted by the fact that a higher price is set for the producer in the first stage of production while a lower price applies to the customer. Gradual verification of the system of dual prices is envisioned particularly for technologically demanding microelectronic elements. The objective is to solve the problem of higher expenditures for production startup due to a lower load ratio while preventing utilization of modern parts from being negatively affected by their price.

In spite of these measures, the prices necessarily reflect the level of costs the lowering of which forms the prerequisite for additional price adjustments. In this area, we will have to pay attention to concentration of production, particularly by orientation toward specialization and cooperation within CEMA. Potential for further lowering of costs is also provided by improving yield, i.e., increasing the share of quality products in the overall number of produced nnits. This problem is also being tackled during production startup by other producers of integrated circuits of a high or very high level of integration worldwide.

My selection of the spare-parts base was not just a random act. It is specifically electronic parts which are the representatives of all the effects that are always mentioned in connection with electronics. The physicotechnical prerequisite for this rather exceptional state in industrial history is constant reduction of the dimensions and of the weight of elementary semiconductor elements and their combining in ever increasing numbers into complex microelectronic circuits. Attainment of this prerequisite occurs at the expense of high cost of research and investment into specialized technological systems whose productive life is much shorter than their potential service life. These costs must be expediently translated into efficient large-series productinn of microelectronic elements. That is a principle that applies worldwide, and if we want to produce effectively, it applies to our country as well.

Accelerated Practical Application

Attendant to the results obtained in the spare-parts base is their expedient application in final production. As part of cooperation by CEMA countries, efforts are underway in the field of line communications to develop a digital communications field and line sets of automated telephone exchanges for over 1,000 subscribers. Efforts also continue in development of new telephone sets with rotary and touch-tone dials and of a digital transmission system of the second order with pulse-code modulation.

In the area of radio communications came successful completion of experimental operation of newly developed medium-wave radio transmitters with an output of 20 and 5 kilowatts. We developed a set for automated measurement of the characteristics of television transmitters. Successful efforts are underway in developing optoelectronic intercom systems. The first large-scale implementation of an optoelectronic system will come with deliveries of compressors for the fourth branch of the gas pipeline to Western Europe.

To promote further development of microelectronic technology, the efforts currently underway are piecemeal production of a BS 600 electron lithograph and development of electro-optical analytic and measuring systems. We are developing new generations of systems for gas and liquid chromatography, electrochemistry and vacuum techniques that can find application in chemistry, medicine, environmental control and elsewhere.

Our sector is developing and producing instrumentation for nuclear power engineering. Dosimetric instrumentation is being developed for health safety purposes and dosimetric control in nuclear power plants as well as other nuclear installations for radiation nygiene and radiation therapy, instruments for nuclear medicine and for environmental control. Measuring and control technology is also being developed to promote the program for saving and economic consumption of fuels and energy--thermostatic controls, temperature controls, specific-ratio thermometers, servi drives for powering control assemblies, etc. We are also working on utilization of solar energy and testing of new principles and technologies for designing metrological instruments without moving parts.

The key intent in health-oriented technology is accelerated modernization, use of viable microelectronic components and of computer technology. Following an agreement with the health sector, we are orienting technological development primarily toward medical electronics for biochemical examinations, electrocardiographs, systemic solution of replacement of vitally important organs and their functions--artificial kidney, dialytic monitor for hemodialysis, new sterilization chambers, bedside monitoring sets, implantable cardiac stimulators and ultrasonic flux meters with a long service life for determining the position of the fetus in its mother's body, etc.

The year 1982 marked the first year of introduction into practical application of the results achieved in the development of new computer technology systems, particularly systems based on a new series of microelectronic

circuits, microprocessors and other auxiliary circuitry. This primarily involves microprocessors for the program SMEP [system of small electronic computers] such as the SM 50/40 8-bit microprocessor system for general applications, automated systems for control of technological processes for the control area, robots and other devices for incorporating into machinery. With these systems also comes the MVS-80 microprocessor developmental system. Other developmental efforts implemented in cooperation with institutions of higher learning and other organizations outside the electrotechnical industry sector include IGS 4500, IGS SM 4/20 interactive graphic systems. By the end of 1982 users will be provided with 10 systems which were awarded the gold medal at last year's machinery fair. New interactive graphic displays--vector and color raster--are also supplied as part of these systems.

We also finished development of a small magnetic tape memory in desk-type arrangement which will become significantly reflected during application of microprocessor systems that will be supplied in the course of the Seventh 5-Year Plan.

In the area of high-voltage electrotechnical engineering, the key tasks of technical development are oriented toward securing continuous operation of the Czechoslovak fuel and energy base, electric machinery and power units, cables and insulators. Development of new electric equipment systems for strip mining of coal must meet the high demands placed on operation under extremely difficult climatic and mechanical conditions. This involves mainly power units and startup mechanisms for long-distance belt conveyers, drives for tips of digging-wheel excavators, vacuum-contact distribution panels, booth-type switching stations, etc.

In the area of power units we are supplementing traditional products by a new design of electric drive for washing machines with electric control for cooperative supplies to an Italian company. A great amount of attention is paid to drives for machine tools in various arrangements. Here I could mention, for example, unidirectional drives for feed mechanisms, stepping drives for grinding machines, etc. In the area of cables and insulators we are orienting our efforts toward development of trailing cables for oversize machinery, high-tension cables with plastic insulation using primarily cross-linkable polyethylene. We came up with the design of semiautomatic resistance-welding machines which in appearance and technical specifications meet the demands of the European market.

Our public is constantly interested in consumer goods. This is borne out by the preponderance of questions asked in meetings with the press as well as the interest evoked by the comprehensive exposition of our sector at the 13th International Exposition of Consumer Goods in spring of 1982 in Brno. I shall point out only several of the relatively large number of innovations that were implemented between 1982-1983. Development has been currently completed on a series of receivers, particularly stereophonic, from which production will start in 1983 on the 817 A hi-fi receiver and the 1901 B stereophonic car radio with playback. Already in production is the K 10 A portable cassette magnetic tape recorder of which 12,500 units are to be

produced. In preparation is production of the COLOR color television receiver sensor with in-line picture-tube screen in which power input will be reduced to approximately 130 watts and its equipment enhanced by several supplementary functions. Development of a new alkaline-burel cell for alarm clocks, electric clocks and calculators is about to be completed. Types LR6 (cerous) and LR20 (large monocell) are already in pilot production.

We also obtained good results in cutting down the time for production runup of the NAD record player which we produce to meet the order of a customer abroad. It was introduced into production in just 9 months. We could continue this enumeration by many other products, specifically electronic calculators and wrist watches that have already been released on the domestic market in late 1982 and will enhance the assortment even more in the current year.

In consumer electronics applies the principle that in order to provide for key innovations it is inevitable, in view of the shorter innovation cycles, to draw up partial 3-year plans for innovations. These plans are operationally adjusted, primarily in keeping with the demands of customer organizations of the domestic and foreign trade.

Our personnel can take pride in the many good results attained since the establishment of the electrotechnical industry sector, but we cannot remain satisfied, primarily not with application of new types of integrated circuits to microprocessor systems. It is not sufficiently flexible, be it within our sector or outside of it. While many voices called for these viable circuits for the past several years now, when we have them, they remain in storage.

Electronization is a demanding task exceeding the scope of a single sector. Its implementation calls for more than just lending full support to electronics. It calls for daily promotion of implementation of elcetronics in industry and in other spheres of the life of our society. Conditions are starting to be conducive to that end, but the point is not to miss the opportunity.

9204
CSO: 2402/29

LOCAL RECIPIENTS OF DUBNA PRIZES

Budapest MUSZAKI ELET in Hungarian 20 Jan 83 p 4

[Text] The prizes of the United Nuclear Research Institute in Dubna are awarded once a year in four categories: theoretical physics, experimental physics, scientific method and applied research. They give one First and one Second prize in the theoretical physics category and one each First and two each Second prizes in the others. Naturally, it sometimes happens that they do not give out all the prizes. The sum for the first prize is 2,000 rubles per category (this is about 34,000 forints at tourist exchange rates) and 1,000 rubles for the second prizes. These sums are received not by individual authors separately but rather by the entire author collectives, however numerous they may be.

There can be a maximum of ten co-authors in the author collective for each competition work and these are voted on at sessions of the scientific councils of the several laboratories. (The Institute has six large laboratories, the size of institutes, and one independent main department which qualifies as a laboratory.) It frequently happens, in the theoretical physics category, that a single author will compete alone; in the other categories the works are generally submitted by co-authors, to a maximum of ten. A deputy director and scientific secretary of the Institute study the works submitted and then a jury is selected from among those who know the subject best and are neutral (not interested in the works submitted). The jury generally consists of 9-11 members; the chairman is one of the deputy directors (the Institute has two deputy directors, both from some member country but never from the Soviet Union). The scientific secretary of the Institute (who is a physicist) is always a member of the jury also. The number of works submitted varies, averaging 20-25.

In 1982 Gyorgy Rubin received a First Dubna Prize and Pal Koncz, Zoltan Seres, Zoltan Fodor and Janos Ero received a Second Dubna Prize.

8984
CSO: 2502/23

CAREER OF TWO SUCCESSFUL TECHNICAL INTELLECTUALS HIGHLIGHTED

Budapest MUSZAKI ELET in Hungarian 20 Jan 83 p 4

[Article by Margit Beke: "A Patent Sold Out of Pocket"]

[Text] Many complain, with reason and justice, that the technical intelligentsia are not appreciated in Hungary today. As a counter-example, let us introduce two experts from the KFKI [Central Physics Research Institute] who are successful--in our opinion.

Gyula Eisler has obtained patents which are recognized in the USA, West Germany, France and England and which the Soviet Union has purchased for manufacturing purposes. This means a profit of several millions for the country and for the KFKI, and a profit of several hundred thousands for the inventor.

This year, Gyorgy Rubin won the highest recognition of the Dubna United Nuclear Research Institute, the first degree of the Institute Prize. He received the prize for his participation in the project titled "Experimental Proof of the Resonant Strengthening of Spatial Parity Violation Arising With the Mutual Effect of Atomic Nuclei and Polarized Neutrons," for preparing the computerized measurement-data collection system.

Let us look at the invention! Gyula Eisler takes from the bottom of his cabinet the pieces of his micro-positioning system. Auxiliary devices in many variations can be attached to the few basic elements of the instrument, depending on the task. The instrument is the result of 10 years of work.

"Which does not mean that it is finished, completed, but rather that it can be developed further according to the needs of the moment."

"How did you go to a pro instrument from building laboratory instruments for physical measurements?"

"It began at the MOM [Hungarian Optical Works], where I went after the university. I had the opportunity to observe how a patent, a new instrument, develops in the process of manufacture, how it is distorted because of faulty documentation, what conditions are needed for a product to be manufactured well. I turned this to my advantage at the KFKI, as compared to those who worked 'only' in research. When I turned to a task I kept in view the picture of an instrument

which could be manufactured well. It is a very long path from a laboratory instrument to series manufacture. One does not have time for refinement with the daily work; this can be done only after hours.

"It takes several years for a patent to become a product--especially if I count market research too. Let me only note that the National Patent Office takes 2-3 years to answer in regard to a patent. I got an answer in 2 months from the USA: but there computers aid the work of the office."

"Even a finished, accepted patent has 'only' moral value. How did you find a manufacturer, a market?"

"The apparatus of the KFKI helped a lot, but I went everywhere myself too. We showed it at the Budapest International Fair and talked about it at places where such instruments might be needed. The Physics Institute of the Budapest Technical University quickly took it over to manufacture for their own purposes and the KUTESZ [Research Equipment Enterprise] is producing them for the market, shipping to the USA also. We talked with the Soviet Union through TESCO [Technical-Scientific Cooperation Office]...."

"And this succeeded so well that manufacture of the product will begin soon in the Soviet Union!"

"Let me mention a serious difficulty in that connection. No Hungarian firm would undertake the organization and expense of exhibiting the instrument abroad. What could I do? I went with a colleague to the Munich Fair, where we offered it 'out of pocket', hoping for business."

"Do you think that an institution should undertake the organizing work, exhibits, market research, etc. while the researcher puts his mind to new inventions?"

"It is not as simple as that. It is my experience that the experts, the inventors, should be there with the trade people, but METRIMPEX [Instrument Industry Foreign Trade Enterprise], for example, might undertake much more than it does at present in these cases."

"But it finally paid off. How do you live, what are you making, do you feel yourself to be respected, successful?"

"I am a designer, I never aspired to a scientific degree. My income was 4,000-5,000-6,000 forints, rising slowly with the passage of time. At present I am a section chief in one of the engineering departments of the KFKI. I like my work very much, and undertake the struggle in an ever more routine fashion. A few things I worked on paid off and one did so outstandingly. What I have done thus far was not in vain."

Gyorgy Rubin is a scientific worker at the KFKI, an electrical engineer. The KFKI is his first place of work. He was at Dubna for 4 years.

"I went into the Hungarian group at the United Nuclear Research Institute. We were dealing with neutron spectroscopic studies. My task was to design a measurement system for these studies. The starting up of the new IBR-2 reactor was approaching. The group was to receive an independent channel on this, giving the physicists great opportunities for new measurements. The new reactor provides a large neutron flux, unique in the world. So the research tasks will be many-sided, and one must also calculate in such cases that a few unforeseen research themes might come up on the new reactor. So when I got the task I began to study neutron physics measurement methods--very broadly interpreted.

"I could have chosen two types of solutions. Following the more traditional path I could have built special purpose equipment for the concrete tasks. But because of the above possibilities and uncertainties it seemed to me to be better to design more general purpose equipment. Thus the equipment grew beyond the needs of the Hungarian group. A Dubna nuclear physics group, hearing of our achievements, looked us up. They wanted to modernize their measurements. In reality it was this measurement that won the Institute Prize, and it was possible for my development to contribute to this too."

"Have you been able to use here at home the experience acquired out there?"

"A finished system already exists at the KFKI and measurements will begin soon."

"If you had to characterize your activity, how would you describe the work you do?"

"It is perhaps easier to approach it from the negative side. I do not develop products or instruments. I do not work on the basis of a need formulated from outside, and even less on the basis of outside specialization. I deal with 'research development' and not with product development."

"Have you thought about a candidate's dissertation?"

"I have thought about thinking about it. I took the necessary examinations at Dubna already. I have written articles. The 'only' thing I have to do now is write it and defend it. This is a few months work. Despite this I have stopped for a while."

"Since engineering work is involved and you are over the difficult part, what is holding you back?"

"I would not call it an obstacle. I am only postponing it a bit. I have joined one of the economic work communities formed at the KFKI. This takes all my free time. I am working on a very interesting theme in the work community too; the atmosphere is very pleasant humanly and professionally. We are enjoying working with responsibility, assuming risks, on a job the results of which will be judged not by a journal reader or the opponents of a dissertation but rather by solvent demand."

8984
CSO: 2502/23

HUNGARIAN-GERMAN RESEARCH ON SILICON COMPOUNDS

Budapest MUSZAKI ELET in Hungarian 20 Jan 83 p 5

[Article by Pal Henscei and Emese Zimonyi: "Intellectual Export of the University; Joint Research"]

[Text] On 20 January the Inorganic Chemistry Faculty of the Budapest Technical University (BME) and the Wacker Chemie CmbH (Munich) are signing a scientific contract on joint research in the area of organic silicon compounds.

The chief research area of the Inorganic Chemistry Faculty of the BME is the chemistry of organic silicon compounds. The effectiveness of their work, covering more than three decades, is indicated by the Kossuth Prize received in 1953 (Proszt, Lipovetz and Nagy), 12 patents, five candidates' dissertations and more than 200 scientific publications appearing in domestic and foreign journals. The research, under the direction of faculty leader Dr Jozsef Nagy, is being conducted in three areas. Basic research includes the creation of relatively simple model compounds, a study of their chemical properties, spectroscopic, dielectric, diffraction, etc. measurements and quantum chemistry calculations. The chief goal of the technological research is working out manufacturing technology for various silicone products important for the economy and a study of their properties, including their thermic stability. In the third research area they are studying the application possibilities of various silicones.

The silicones have a number of favorable properties. They can be used over a broad temperature range without substantial change in their characteristics, they have a water repelling and adhesion prevention effect, their chemical stability is good, they form weather resisting and corrosion protective coatings, their electric properties are favorable and they are physiological inactive. The most important forms in which silicone products appear are: oils, emulsions, foam inhibitors, fats, rubbers, resins and lacquers.

The silicone oils can be used at low and high temperatures alike as heat transmission and hydraulic fluids; as additives to mineral oils they give favorable properties to the products obtained. From silicone oils they prepare mold separation emulsions which are used in casting, the synthetics industry and the foodstuffs industry technologies, in the course of fermentation, to stuff pipelines and refrigerators and as flexible bedding for telecommunications parts. Weather resistant, heat resistant and corrosion protective coatings can be made from silicone resins.

Monuments and the facades of new buildings can be protected by silicone treatment. The adhesive component of lamp mountings is based on silicone. Silicone rubbers are used in technical areas and in medicine (dentistry, brain surgery and plastic surgery). Some of the organic silicon compounds have come into the center of interest in recent years, by virtue of their unique biological activity.

Researchers report on the results of work in the area of the chemistry of organic silicon compounds at the international organic silicon chemistry conferences held regularly every 3 years. In recognition of domestic achievements the sixth conference was held in Budapest in 1981, and it was here that the need for the development of scientific-technical cooperation between the Inorganic Chemistry Faculty of the BME and the Wacker Chemie GmbH came up. The Wacker Chemie GmbH is one of the world's largest factories producing silicones and organic silicon monomers. Its products are used widely in Hungary and are traded by the Agentura Kft [limited liability company]. In 1982 it imported about 250 tons of various silicone products from the Wacker firm. The firm has a considerable research base which continually watches the results achieved at other research sites. The goal of the cooperation is closer contact between the two parties and the exchange of scientific information.

The faculty expects from the cooperation an increase in the effectiveness of silicone research. On the basis of the contract the Wacker firm will provide the import basic materials needed for research. The consultations will make it possible for researchers at the faculty to become acquainted with the most developed equipment and technologies.

The wacker firm expects from the researchers of the faculty a high level solution of the problems of domestic silicone users, on the basis of which they may use additional silicone products. Since there is no silicone monomer manufacture in Hungary it is possible that technologies developed domestically will be introduced industrially at the Wacker firm.

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MANUFACTURERS EXHIBIT NEW MICROPROCESSORS, PROGRAMS

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 p 1

[Unsigned article: "Microcomputer Applications in Socialist Countries"]

[Text] The deputy chiefs of the Applications Council for Computer Technology Devices (SZEAT) discussed microcomputer applications in Budapest between 15 and 20 November. Delegates from the Coordination Center of the SZKB [Intergovernmental Committee for Computer Technology] and the CEMA Secretariat participated in the discussions in addition to representatives of the socialist countries.

The Hungarian delegation was led by Dr Lajos Varga, a main department chief and deputy chief of the Hungarian branch of the SZEAT. The agenda of the conference included a review of the situation of microcomputer applications in the socialist countries and the work plan of the SZEAT was supplemented by themes aiding the spread of microcomputers.

The participants designated the chief directions for the development of applications programs, technologies and requirements and for the solution of education and consultation problems. They noted, however, that the tasks falling on the council deriving from the resolutions passed at the 23rd session of the SZKB and the 36th session of CEMA must be taken into consideration also in the final development of the work plan. A small exhibit displaying a few domestic applications of microcomputers of Hungarian manufacture was organized at the same time as the conference. (See the article on page 3 titled "A Small Exhibit of Domestic Microcomputers")

Within the framework of the professional program the participants visited the KFKI [Central Physics Research Institute] and the SZKI [Computer Technology Coordination Institute], where they became acquainted with microcomputer technology developments.

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 pp 3, 14

[Article by Margit Takacs: "A Small Exhibit of Domestic Microcomputers"]

[Text] As we reported on the first page of our journal, representatives of the national branches discussed applications of microprocessor technology

at a Budapest meeting, in November, of the SZEAT under the auspices of the Applications Council of the SZKB. In connection with the conference a small exhibit displaying achievements and trends of Hungarian microcomputer manufacture and applications opened in the Arpad Szakasits Street headquarters of the SZAMALK [Computer Technology Applications Enterprise].

Eighteeen Hungarian institutions displayed 25 microcomputer devices, with a number of applications programs. The chief characteristic of the exhibit was the varied nature of the applications--microcomputers used in industry, agriculture, medicine, office work and many other areas were "demonstrated" with text editing, timekeeping, educational, program development, etc. programs.

In addition to the famous, well known firms developing and manufacturing computer technology, representatives of smaller cooperatives and economic associations also exhibited their products.

In the following lines we will publish some of the information received from exhibitors about new equipment and applications.

Central Physics Research Institute

The NE-657 intelligent, color display terminal is controlled by an 8080A microprocessor and has 448 by 288 raster resolution. It can be used well for conversational mode display of control room schema in industrial process control (such terminals are being used, for example, in the Szazhalombatta power plant and the Tisza Oil Refinery), for instruction, traffic control, etc.

The NR-4101/UNA general business microprocessor computer has an outstanding supply of software and peripherals. (The TPA [stored program data processing] machines can be run with a ful set of programs.)

Signal Technology Cooperative

The HT680X is a modular microcomputer system. The many sorts of connection possibilities and the modular construction make possible the development of an optimal configuration. It is offered primarily for technical-scientific calculations, carrying out financial and commercial tasks, collecting measurement data and industrial process control. They are now working on installing the first hospital-medical system.

Kalman Kando Electric Industry Technical College, Mathematics and Computer Technology Institute

On a commission from the BRG [Budapest Radio Technology Factory] they made peripheral connections for a microcomputer system based on the ABC-80--memory expansion and connections for printer and dual floppy disk background store--thus significantly expanding the applications possibilities of the ABC-80 system. They are used in teaching several subjects at the college (for example, mathematics and for laboratory and measurement exercises).

KKVMF Computer Technology Institute

The META M6800 developmental system prepared at Szekesfehervar is used to teach BASIC, test microprocessor elements and for hardware and software development.

VILATI [Electric Automation Institute]

The FLPPPYMAT-SP is a freely programmable, floppy disk data preparation and processing microcomputer (with 2-4 drive units) suitable primarily for business processing. Programming languages: Assembler and Pascal subset.

VIDEOTON

Several hundred of the VT20 minicomputers are in operation already throughout the country, primarily in the solution of business, stockpile management, warehouse record keeping and agricultural tasks. A modernized version, the VT20/4, will appear in 1983 with a broader selection of user software and high level programming languages (BASIC, FORTRAN, COBOL, PASCAL).

The RPT-80 remote process terminal is a special measurement and data collection system which can be used under hard field conditions, for example in petroleum mining and geodetic tests.

The VIDEOTON Personal Computer has modular construction with RAM which can be expanded to 64 K bytes. It can be used in education, office work, payroll, etc. Series manufacture will begin in 1983.

LSI Applications Consulting Service

Twentyfive prototypes of the MICKEY-80 microcomputer are working already in university faculties, secondary schools, at the AFIT [Industrial Trust for Auto Maintenance] and in producer cooperatives. The New Life Producer Cooperative in Sarisap manufactured 300 units in 1982 and the 1983 plan is for 1,000 units.

Boscoop Agricultural-Industrial Joint Enterprise

Flexible worktime recording system: a maximum of 64 units, in a zone of 1 kilometer, can be connected by telephone line to a Z80 based microcomputer; the units read a plastic card identifying the worker and record the time and cause of absence. The cards can distinguish, by a punch code, 100,000 workers each for 100 enterprises. Many other uses are possible for the card reading system attached to the computer; for example, in mines, in addition to recording work time, they could be used to follow miners underground, to follow work on conveyor belts or in multi-site plants and to keep real-time stockpile records.

Medicor

The MOD-81M is a modular data collection system which helps a physician by collecting, ordering and evaluating large volumes of analog and digital

data provided by intelligent diagnostic instruments. It has a floppy disk operating system and high level programming languages (PASCAL, BASIC, CLSP). Series manufacture has begun.

Rolitron Association

The ROSY-80 microcomputer family consists of the single card ROSY-80T and F and the ROSY-80B models constructed in a modular bus system, with a 64 K byte central unit and a Z80 microprocessor. Applications areas are: as a microcomputer developmental system, as control units for measurement automats and industrial processes, as office text editors and for hospital patient record keeping.

MTA Computer Technology and Automation Research Institute

The VARYTER microcomputer has a maximum storage capacity of 128 K bytes. It can be used for financial porcessing, office business, measurement data collection and evaluation, agricultural production guidance, etc.

The MS 700 network control series is a multi-microprocessor system with a maximum common storage capacity of 128 K bytes; it can be used to control packet switching networks, to connect various types of terminals into the network, etc.

Computer Technology Coordination Institute

The Teleterm programmable terminal family, which can be connected to the telephone net, has 16 K bytes ROM, 16 K bytes REPROM, asynchronous V.24 switching and connected TTL lines. For department store and commercial applications a line code reader can be connected also. The TELEDATA system based on a personal computer can be used for stockpile management, reservation systems and banking. The MO8X professional personal computer can be used for, among other things, user program development, warehouse record keeping, engineering design and recording and maintaining documentation.

Office Machine Industry and Precision Engineering Enterprise

The BDT-100/Sp1 terminal offers an automatic data input possibility with light pen (line code reading) and stores data retained for a minimum of 90 days. It is used primarily in commerce but is advantageous for health affairs, libraries, travel offices, etc.

Hungarian Optical Works

The MF 3200 floppy disk store and the MF 1800/900 mini-floppy disk store are highly reliable products being manufactured in large series at a high technical level.

Budapest Radio Technology Factory

The SLK-80 microcomputer can be programmed in BASIC and has a storage capacity of 32 K bytes. It is offered for educational institutions, office

data recording and to prepare technological programs. An interpreter program has been prepared for it making possible use of dual floppy disks.

Electronic Measurement Device Factory

The EMG 777 desktop computer can be programmed in BASIC. It is suitable for technical-scientific calculations, control of measurement systems, medium scale data processing and, with a graphic expansion, two dimensional graphic tasks and depicting functions.

Microelectronics Enterprise

The ICOMAT 110-C LSI testing automat can be used for functional testing of integrated circuits and to generate test signals for memories and other LSI equipment. When testing integrated circuits of the operational store type the upper limit is 64 K words. The maximum frequency of the test signals is 10 MHz. The very valuable equipment--which is manufactured only in our homeland among the socialist countries--is shipped to the GDR and the Soviet Union also.

What was seen at the exhibit also shows that the technical and other conditions for the manufacture and mass use of microcomputers are developing in our homeland. But further steps are needed to ensure the manufacture of micro-peripherals--small line printers, floppy disk stores and small size, large capacity magnetic tapes--and to provide a broad variety of software (basic software independent of model, standard operating systems, database management programs, software supporting teleprocessing, etc.).

The cooperation of the socialist countries and the possibilities of international coordination and division of labor are of great significance in doing this, as in making use of the developmental and manufacturing achievements attained thus far.

The idea of the organizers to link the exhibit to the SZEAT program will certainly aid further cooperation and division of labor because these products of Hungarian industry persuasively illustrate the intellectual potential of the profession and those possibilities we have which could mean broader use and sales.

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BRG DEVELOPS NEW MICROCOMPUTER DATA COLLECTOR

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 p 5

[Article by Janos Palich, Budapest Radio Technology Factory: "New Data Collectors"]

[Text] The Budapest Radio Technology Factory (BRG) has developed a new family of microcomputer data collectors, the SLK-80, to replace the SLK-4 data recorders and the ABC-80 equipment manufactured on a cooperative basis.

The SLK-80 is comparable to the ABC-80 equipment which can be regarded as the basic model and which was sold in earlier years, primarily to educational institutions, and is suitable primarily for solving mathematical, physical and other designing tasks. But the SLK-80 is simpler and cheaper. A U880D microprocessor controls the central unit. The storage capacity is 32 K bytes RAM. It contains all those circuits needed to operate the equipment, generate sound signals and provide real-time timing. Its display unit is a normal TV set, control being realized via the antenna input. The so-called VIDEO-RAM circuit (with a storage capacity of an additional 3 K bytes) in the central unit provides 24 x 40/80 character control as the screen content. With the aid of a software program it is possible to illuminate individual characters on the screen, provide inverse video signal formation (light background with black characters or symbols), underline characters and provide a quasi-graphic mode equivalent to the ABC-80. Characters are displayed with a 6 x 10 point matrix, using 2 x 3 points in the quasi-graphic mode, and the writing speed on the screen is 64 microseconds (per character). KM III magnetic tape cassette mechanics, manufactured by BRG, are built in as background storage.

Two types of keyboard can be used to input prograss and data. The simpler and cheaper version has 62 mechanically activated keys, corresponding to the normal typewriter keyboard. The more demanding version has 80 "sound generator" pressure keys (non-rotating, without contacts).

The SLK-80/A equipment can be used advantageously to replace the SLK-4 and SLK-4/AR equipment proven in earlier years with favorable user experience (with which data was recorded in decentralized office work sites and with which, after 1980, complete wage calculations, materials management processing, etc. were done with the aid of arithmetic) and to replace equipment in the office bookkeeping, data recording and minicomputer category.

A Z80/A microprocessor controls the central unit. It can carry out the functions already described for the SLK-80 but it has 64 K bytes of RAM storage. It can be used to control a color TV or monitor also, where the color of the characters and background can be programmed as desired. The storage capacity of the VIDEO-RAM is an additional 6 K bytes. It also is equipped with magnetic tape cassette background storage with KM III mechanics. It can be used with two dual floppy disk drives (four units, MOM MF-900 type). The unit was designed to accomodate an additional maximum of eight connector cards of various types.

The connector cards which can be ordered as options are: the SLK-80 SIFK, serial card (V24, RS 232 C, programmable from 75 to 9,600 baud); the SLK-80 PIFK, parallel card (for connecting the SLK-, SLK-4/AR, EK-9006, EK-9006/B, VT-340, ER-300, DZM-180 etc. units); the SLK-80 card for the SD 1156 Soemtron mosaic printer of GDR manufacture, with back and forth printing; and the SLK-80 HDLC, serial card, in accordance with the IBM SDLC/HDLC protocol.

The BRG provides the BASIC programming language for the microcomputer. The basic software can be loaded from magnetic tape cassette. A chief goal of the development was to make it possible to run on the new machine the programs written for the ABC-80 units sold earlier. The cassettes prepared for the ABC can be used on the SLK-80 machines also.

The MSYS operating system developed--which the BRG delivers for the SLK-80/A machines--is compatible with the CP/M 2.2 operating system developed by Digital Research. This makes it possible to run every CP/M 2.2 compatible program on the equipment (p FORTRAN, COBOL and various text editing programs). The "CBASIC" Basic programming language ensures operation and use of the dual floppy disks. (In practice, this is the floppy disk version of the BASIC programming language written on the cassette.) It is also possible to do machine code or assembler level programming with the help of the assembler editing and debugging programs.

An SLK-4 data recording program package--field declaration--and an SLK-4 data processing program package can be developed also.

The simpler SLK-80 central unit with HT keyboard costs 75,000 forints while the complete system (SLK-80/A central unit, HT keyboard, one dual floppy disk and the various connector cards listed) will be sold by BRG in 1983 for 163,000 forints.

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COMPUTER RESEARCH AT OSKAR LANGE ACADEMY, WROCLAW

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 p 7

[Article by Adam Kopinsky and Stefan Zajonc: "Computer Technology Research at the Oskar Lange Economics Academy, II"]

> [Text] Education and scientific research constitute the chief directions of the activity of the academy. In the first article in the series we reported on the instruction taking place in the day and evening branches of the institute and on the tasks and goals of the Scientific Research Center, now independent of the academy.
>
> In the second part we will examine the research work of the faculties, an important factor in the development of the national economy.--The editors

Computer Technology Faculty

We designed and introduced the following information systems, primarily to satisfy educational needs.

MIRAFIN

Its goal is to automate all bookkeeping and accounting activity taking place in accounting and financial units. The system, which uses a minicomputer with magnetic disk storage (MERA-305), provides information for the enterprise leadership and interested units primarily in the form of periodic printouts. It is used in the administration of our academy and in a number of institutes throughout the country.

MIRAST

This is a bookkeeping system covering fixed assets and the structure of and changes in them. It provides information about use, amortization and scrapping of fixed assets and can be used to show inventory deviations by organizational unit.

TEST

This is an educational and testing system. Its two chief functions are checking the knowledge of instruction and users (students). Since dialog with the computer through telex typewriters plays the fundamental role in the system this is the most important element of the system. A picture screen monitor displays the study material (the monitor is the output device here). We listed the study material in four theme groups in the TEST system. In the interest of better recording what is said in the lectures we standardized exercises and special sections on MERA-305 and MERA-306 minicomputers.

OSKAR

We worked out and introduced a system which prepares students individually to analyze information systems and design information structures. An auxiliary instructional system is programmed to the learning process and the instructional programs are used on an ESZ 1032 computer. The computer is controlled by the ESZR [Uniform Computer Technology System] OS operating system. The system serves to solve one or several tasks; a group of one each of a certain number of execution and organization modules thematically and functionally connected to one another provides the so-called operational mode of the OSKAR system. At present the system carries out the following tasks: instruction, help, calculations, programming, cataloging, retrieval and control. Each can be used independently or in an integrated fashion.

WINT

We took over and introduced the WINT technical and scientific information search system. It can be used independently or as one of the modules of the OSKAR system, to compile and edit informational material, together with the catalogs of the central academy library.

Scientific research in the near future will proceed in two chief directions--in addition to individual research projects.

--Scientific research connected with the chief problems designated by the Ministry of Science, Higher Education and Technology, which we carry out together with other institutions of higher education, as theme coordinator. This will include the last phase of the programming and implementation work connected with the technical project worked out in 1979-1980 for an accounting, financial and budget automated guidance system. In addition, a further development of OSKAR; the system will deal with such problems as how to apply mathematics and statistics to the solution of economic, organizational and enterprise guidance problems, etc.

--Work being done on order for economic organizations.

The further development (perfection) of an automated guidance system for a mining combine consists of our analyzing and evaluating the accounting system functioning now, working out an integrated and automated economic system and adapting an automated accounting guidance system working on a MERA-300 to the MERA-400 computer.

We implemented a HADES data base management system on an ODRA-1305 computer on the basis of IMS (a leadership information system in the FRG), in cooperation with the computer manufacturer.

A communal (sewage) enterprise automated guidance system--we developed the model of the system and a concept for the economic information system.

Continuing work on fixed assets and cost accounting subsystems for an enterprise manufacturing electrotechnical porcelain.

Economic Cybernetics Faculty

Chief scientific research projects of the recent past:

--Application of statistics and computer technology in the guidance of economic installations. (The title of one scientific research project connected with this was: "Development of a Materials Use Control System and Materials Use Norms Schedule for a Metallurgical Combine.") In addition two themes were researched for the Ministry of Science, Higher Education and Technology; the first dealt with a college application of an automated guidance system, "An Experiment in Setting Up a Two-Shift Schedule for Large Lecture Halls and Schools." The second project began in 1980. Its theme: "Use of Multi-Dimensional Comparative Analysis Methods In Evaluating and Calculating Social-Economic Indexes."

--Questions of modeling systems and economic processes.

--Questions of developing, operating and optimizing a multi-level system which corresponds to the hierarchic structure of the national economy.

--Creating econometric models (dynamic systems and their applications in forecasting, spectral analysis of time series, selecting model variants). Comparative analysis (the problems of developmental indexes, use of comparative analysis in given areas, questions of discriminant analysis).

--Mathematical bases (logic, Boolean algebra, formal languages) which can be used in connection with classification, allocation and programming problems of technical tasks of production guidance.

--Use of mathematical methods in solving practical guidance problems (for example, an economic and mathematical model concept for guidance of a ship fleet is a theme in this area).

--Approximation theory (primarily a study of the C function and the Chebyshev center, the theory of "fuzzy"--uncertain--sets and dynamic systems). This research has certain direct practical applications also; in the one hand the solutions of the optimization tasks are stable and, on the other hand, it was possible to interpret even complex dynamic systems mathematically.

Our research projects also include those which examine what mathematical-statistical methods we should use for the analysis of macro- or micro-economic activities.

Let us look at these research tasks in a grouping according to theme.

--A system for materials use analysis of mining enterprises, or the calculation of statistically founded norms. The system analyses warehouse materials drawing forms; on the basis of the volume produced by the mine sections it calculates--in terms of both quantity and quality--use per unit. The time series of the use serves as a basis for norms for confidence-limits for average use per unit. (The program underlying the calculations was written in FORTRAN.)

--The national economy as a dynamic system; as part of this work we created a mathematical model of the national economy which is a generalization of the classical model.

--Non-classical statistical prediction methods; we offer a method for the study of complex phenomena, an experimental plan for predictions in addition to the main trend and how to adapt non-stable econometric models to forecasting requirements.

--Use of multi-dimensional comparative analysis to estimate and define social-economic indexes.

--A computerized scheduling system (workers from our computer center helped in the development of this at the academy).

Bilateral Contacts

The computer technology developments prescribed in our economy must be closely linked to the economic reform under way. We hope, by making use of the computer technology capacity of Poland, to create systems which may serve as a basis for making long and short range decisions. We are counting on the development of computer technology in other branches of economic life also--in control of manufacturing processes, in various reservation systems, in engineering calculations, etc.

When realizing economic reform in Poland we take into consideration the theoretical and practical experiences garnered in the course of introducing various phases of the reform in Hungary.

The most important characteristics of the reform are: to reduce the centralization of guidance, to increase the role of the socialist enterprise, to provide material incentive for increased labor productivity and economic efficiency, a principle of profitability and financial independence, to strengthen the socialist market taking into consideration the law of supply and demand as a price generation factor, and to take measures having as their goal the creation of economic conditions for the balance and constant growth of the national economy (primarily the development of light industry, agriculture, services and domestic and foreign trade).

Such important changes in the management system will aid the development of computer technology also. Computer technology is a tool for the collection

and analysis of the totality of objective and reliable accounting-statistical data needed to create a uniform, flexible information system concerning the functioning of the national economy.

In recent years workers from our academy have visited higher level Hungarian institutions on several occasions; they undertook scientific exercises (for example at SZAMOK [Computer Technology Training Center], SZAMALK [Computer Technology Applications Enterprise] is its legal successor); they participated in international seminars and symposia on computer technology, statistics and econometrics. In the future also we intend to make use of the valuable scientific experiences of the Hungarian experts, their rich experiences in using computer technology in such areas as guidance of socialist enterprises, determining optimal manufacturing programs, preparing commodity production, energetics, financial and even manpower balances, in central economic planning, in constant supervision of plan fulfillment and, which is very important, in improving services offered to the populace (market research, preparing commodity lists, public savings accounts, referring clients and retrieval of technical and scientific information).

Similarly, we must be interested in observable development in every form of automated guidance systems for social-production processes.

It is to be hoped that--together with our Hungarian friends--we will be able to select from this rich sphere of problems those areas for scientific research cooperation which interest both sides and are useful to both.

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NEW SOFTWARE DEVELOPED FOR MERA-9150

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 p 11

[Article by Tibor Nanassy: "New Operating System for the MERA-9150"]

[Text] MERMAT has further developed the 7E.3 version of the operating system for the MERA-9150 and given it the designation MT-1. The new software product will be tested in Hungary in the first quarter of 1983. The essence of the further development is that the already well known VALIDATOR language has been expanded with new instructions, making possible a selective read-in of opened records according to a given key.

Instructions

ACCEPT operation code, operand: variable

When the ACCEPT instruction is executed the running of the program is interrupted and it becomes possible to input an optional value from the keyboard of the data input work site. A sound signal accompanies execution of the instruction. After depressing the RESET key the sound signal ceases and "underline characters" appear (on the second line of the screen) in the order of the messages maintained; these determine the number of characters to be entered. One must then key in the data or depress the HELP key, which means that we will not give a new value to the current variable. The attribute of the variable controls data input; that is, the value of the variable determines the number of characters which can be keyed in and its type determines what characters can be entered.

CANCEL operation code

This instruction can be used in record and data batch verification programs (a data batch consists of several records). Executing the instruction results in erasing the current record and making the record following it the current one.

INSERT operation code, operands: variable, field, numeric literal

Can be used in record and data batch verification programs. Executing the instruction results in inserting a record before the current record, from

the keyboard of the screen. The value of the variable, field or literal determines the line number of the format of the record inserted.

MARK operation code

Use of the instruction is permitted in data batch verification and output programs. Its execution results in storing the line number of the current record. Access to the record cited with the aid of the MARK instruction is possible only with the OBTAIN DOCUMENT instruction. Only one record can be cited with the aid of the MARK instruction in a given data batch. Repeated use of the instruction will result in overwriting the stored value. Beginning the processing of a new data batch erases the value of the MARK.

OBTAIN DOCUMENT operation code

The instruction can be used only in data batch verification and output programs. Execution of the instruction results in completing the processing of the current record, and the record cited with the MARK instruction becomes the current record of the data batch. If the MARK instruction was not used earlier in the processing of this data batch then an error message appears on the screen informing of the absence of the MARK instruction and of an interruption in the running of the program.

OBTAIN CURRENT operation code

The instruction can be used only in data batch verification and output programs. After execution of the instruction the processing of the current data batch is completed. Processing resumes from the first record of this data batch.

OBTAIN PREVIOUS operation code

Use of the instruction is permitted only in output programs. Execution of it results in completing the processing of the current data batch, and processing resumes from the first record of the data batch prior to the current data batch in order in the entire data file.

OBTAIN FIRST operation code

Use of the instruction is permitted only in output programs. With execution of the instruction the processing of the current data batch is completed and processing resumes from the first record of the very first data batch in order in the entire data file.

If the OBTAIN PREVIOUS or OBTAIN FIRST instructions are executed in relationship to the very first data batch in the entire data file they have the same effect as the OBTAIN CURRENT instruction.

The services of the MOVE instruction have been expanded in the MT-1 operating system also. The date and the name of the so-called "standard job" or data batch can be put into the variable also.

MOVE TO operation code, source operands: date, standard job name, data batch name; destination operand: variable

Selective reading in of a record from magnetic tape is possible by using the following options: READ STANDARD JOB; READ BATCH

The records can be read from tape to disk according to the key given in the data batch. After defining the parameters of the read-in one must give the name of the data batch containing the keys. Writing the keys into the data batch makes possible the selective read-in of records to disk even if only a single magnetic tape unit is available.

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SOVIET MINICOMPUTER FIRMS HOLD EXHIBIT IN BUDAPEST

Budapest SZAMITASTECHNIKA in Hungarian No 12, Dec 82 p 8

[Article by A. K.: "Soviet MSZR Devices"]

[Text] MINPRIBOR is one of the largest ministries of the Soviet Union. Its full name is virtually untranslatable--Ministry of Instrument Manufacture Automation Devices and guidance Systems. In addition to a broad spectrum of the instrument industry its profile includes computer technology also. MINPRIBOR represents the minicomputer line in the international division of labor, in the computer technology cooperation of the socialist countries. This does not mean that its activities do not extend to large computers. But these are distributed in the Soviet Union and are rarely exported.

In recent years the products of its factories and institutes have appeared in Hungary. First of all we must mention the SZM-4 conicomputers, increasing numbers of which can be found among domestic users. The contacts made with MINPRIBOR in the course of trade in the SZM-4 have proven to both sides that not only are there real possibilities for cooperation but also that there is a common interest.

In essence it was this that prompted the Elektronorgtechnika Foreign Trade Enterprise, the Soviet computer exporter, and SZAMALK [Computer Technology Applications Enterprise], the largest domestic trader in Soviet computers, to jointly arrange an exhibit of MINPRIBOR products in Budapest. (See our report on the exhibit and the opening of the symposium in our November issue. --The Editors) The exhibit--in conjunction with which there was a symposium giving details on the products--was intended primarily to popularize the current trend in applications, the spread of the mini and micro category. It was the distinct intention to introduce those interested to operating systems also. Thus, in connection with the devices reported on below, it must be remembered that throughout the exhibit they were mutually linked, operating as a sort of network. (Diagram 1 shows the device configuration shown at the exhibit.) At the center of the configuration stands an SZM-4 of the largest possible size. Novelties at the exhibit were the graphic display and asynchronous line connectors, which the visitors could not see otherwise. These two devices alone would not have justified the SZM-4 exhibit. The essential thing was the line link to two other microcomputers,

with which it was possible to represent the development of an SZM-4 centered micro-network.

The SZM-4 was connected to two microcomputers ot MINPRIBOR, different architecturally and in operating principle, an SZM 1300 and an SZM 1800.

The SZM 1300 stands closer to the SZM-4, since the two models are software compatible. The SZM 1300 is actually nothing more than an SZM-3 made up of microprocessors. The designers intended the system for technological process control. Among the peripherals shown great interest can be expected in the display adapter, with the use of which a color television was connected to the system. Graphic applications possibilities were demonstrated with the aid of this (naturally for limited needs).

The other microcomputer seen at the exhibit, the SZM 1800, represents an applications trend deviating from what has gone before. The developers are thus making available to users a device of modular construction which can be varied over a broad scale.

Their chief goal was to provide a solution to the following tasks: creating installation switching equipment with a distributed architecture (real-time peripherals); developing a general purpose microcomputer with broad functional possibilities, in both data processing and industrial applications; creating intelligent terminals and built-in programmable control units; developing applications systems by virtue of which the micro-devices of computer technology might be extended in the Soviet Union to those applications areas in which they did not exist up to now.

Both the SZM 1300 and the SZM 1800 are based exclusively on Soviet parts. This ensures continuity in manufacture and deliverability.

In Diagram 2 one can see in the sub configuration of the SZM 1800 a unique feature previously unknown in our homeland, the ACV alphanumeric video terminal (ACV means raster graphic display). It serves to display graphic information, histograms and function graphs, with the mosaic method. It has a built-in refresh memory. The picture can be displayed on black-white or color monitors. At the exhibit one could see a VK-40 monitor, but it is also possible to use a normal television set. But the adapter needed for this does not belong to the ACV.

Joint testing of the ACV has not taken place as yet (at the time of the exhibit) so for the time being it is not for sale. But according to information from the Soviet experts this was to be done in 1982, so hopefully the device, which aroused great interest, will soon reach Hungarian users also.

The Budapest exhibit of MINPRIBOR was a success. The public could become acquainted with brand new devices and with new applications possibilities for devices already in use. Since this was the third such exhibit at SZAMALK (or at its legal predecessor) it is to be hoped that it will become a tradition and that in the future the professional public can regularly meet

with the new devices and plans of the manufacturers and receive advice and information directly from the developers.

Key:
Diagram 1.

Kozponti egyseg: Central unit
SZM 5400: Double 2.5 M byte magnetic disk storage
SZM 5300: Magnetic tape storage
SZM 5603: Floppy disk storage
SZM 6315 : Line printer
SZM 9104: Process peripheral connector
SZM 7300: Vector graphic display
ADSZ: Asynchronous line connector
VDT52100: Alphanumeric display (Videoton--VT52)
VTA2000: Alphanumeric display (Soviet--VT05)
DZM-180: Mosaic printer
UVIT: Display (monitor connector)
KS: Common bus
USZOS: Common bus connector
BRSZ: System expansion block
RIF: Bus amplifier
ACV: Raster graphic display
PKU: Control and programming panel
OZU: Operational memory (64 K words)

Diagram 2.

Szamitogep: Computer
UVIT: Unit for data transmission to screen
UVKSZ: Keyboard (for data input)
UVKF: Functional keyboard
VKU: TV monitor

8984
CSO: 2502/24

SMALL SERIES PRODUCTION OF PERSONAL COMPUTERS UNDERWAY

Budapest OTLET in Hungarian 25 Nov 82 pp 8-9

[Summary] The first Hungarian personal computer has been fabricated by the young Lukacs brothers who now operate a business work partnership known as Homelab. The computer is in the same class as the British Sinclair 2 x 81 but is about 5 times as fast. Its basic memory equals that of the 81 with expansion. The Hungarian computer can be used to make drawings. In this respect, only the Sinclair Spectrum is its equal.

While the ZX family is made in series of thousands and millions, the same is not true of the Hungarian machine. The computer was fabricated in response to a competition sponsored by the Institute for Scientific Organization and Information (Tudomanyszervezesi es Informatika Intezet). Although it was completed by the deadline, it was in no condition to be exhibited because the work of the brothers received no official support. Parts were lacking and had to be homemade. Support for the project finally came from the BOSCOOP Agricultural Enterprise which had Homelab prepare 10 prototypes. Then Homelab accepted an order for 50 computers.

According to the Lukacs brothers, there is demand from many more such computers, but the shortage of parts makes it uncertain whether even the 50 on order will be deliverable by the end of the year. Acquisition of parts is "difficult, virtually impossible. Some can be obtained only for foreign exchange, and once they are in the country, the state or private sellers triple their sales price. The personal computer is also hampered by regulations according to which parts obtainable for dollars only may account for no more than 8 percent of the total value of the computer. While this may be a valid overall regulation, in the case of the personal computer a slight percentage overrun amounts to but a few dollars whereas the end result is worth many times this. Paradoxically, the percentage overrun would actually save the country hard currency," claim the Lukacs brothers.

The Homelab personal computer will cost about 15,000 forints once production is stepped up. The device can be used as peripheral for a large computer or independently to perform a great variety of tasks.

CSO: 2502/31

CENTRAL COMPUTER TECHNOLOGY DEVELOPMENT PROGRAM SUMMARIZED

Budapest IPARGAZDASAG in Hungarian No 10, Oct 82 pp 1-4

[Article by Lajos Pesti, Central Statistical Bureau: "On the Central Computer Technology Development Program*"]

[Text] My contribution to the activity of the conference, the evaluation of the Organizational Computer Technology Exhibit and the appraisal of its achievements and opportunities is made by presenting the application goals of the developmental government program of the computer technology center, the achievements made up to the present and also the difficulties and by outlining the further tasks.

Background

The rapid growth and spread of the production and application of computers has been caused by a world wide sociological necessity. Prior to World War II but especially following it, technological preparedness increased manifold in every area of production and economy. This development, however, was not matched by the tools, methods and procedures of data processing.

This contradiction resulted in powerful sociological tensions, and since they were relieved by the use of electronic data processing tools, this industry branch embarked on an explosive development program even three decades ago.

According to statistical data and expert estimates, the number of computers in use in the world today is more than 1 million. Their value is 180 billion dollars, and the rate of growth has not decreased in spite of the known recession in the West. In most of the socialist countries, the conscious, organized development was not started until the 1970s. In our country, at the beginning of the 1960s, hardly 10 computers were operating, and we considered it a significant achievement that by the end of the 1970s their number increased to 120.

Prior to the preparation of the Central Computer Technology Development Program, however, isolated and individual requests were satisfied, the shops were rather

*Based on the presentation delivered at the "Organizational Computer Technology Conference" organized by the Szolnok Megye Organ of the SZVT.

heterogeneous, and the lack of coordination in computer technology had a series of unfavorable effects.

Although late, we realized that, at the level of the national economy, the effective use of computer technology cannot be accomplished by spontaneous decisions, but rather within the framework of a comprehensive program taking into account international experience, domestic requirements and the available resources, which demands beyond the general regulators of economic management, central coordination, the use of resources and tools. This is why, in November 1971, the Council of Ministers prepared and approved the Central Computer Technology Development Program.

According to the government position, the establishing and spreading of the computer technology culture is a significant factor and a basic requirement for increasing social effectiveness and economic development.

The program, based on our participation in the integrated cooperation of socialist countries and taking into account the capitalistic trade balance of our rational economy, decided to[disseminate]of the tools of the universal computer systems (ESZR) as the basic computerization. During the 10-year execution of the program, a planned and coordinated development took shape. The use and production of computers and the centrally coordinated management of the activities connected with these has been gradually implemented. The capital assets of the domestic computerization today is already supplied mostly from socialist imports and domestic prodcution. The rational use of budget estimates and capitalistic exchange funds have been organized. The ministries and central authorities are striving to coordinate application and development of the branches based on the central directives. The program accelerated and better organized the development. Up to now, the basis for an extended use of computer technology has been established practically in every facet of the peoples economy. At the same time, those factors which retard the further development of computer technology and reduce its effectiveness also became clear and must be coped with in the coming years.

Given the heavy burden placed on the resources of the national economy, the program aimed, though slower than world tendencies, to place into operation 400 computers by the end of 1965, and 700 by 1980. The number of machines prescribed in the five-year plan was exceeded; there were 750 machines in operation at that time. Of course, I am not here considering minicomputers and microcomputers; this number only indicates small, medium and medium large computers. This output, however--and this must be emphasized with regret--also means that our disadvantage compared to Western Europe further increased and today is about 10 years. In the minicomputer category, we exceeded the relatively low 1980 goals, but in the area of large computers and remote data processing shortfall became significant at the end of the first planning period.

In the developed European capitalist countries, the increase in the number of minicomputers has been incredibly fast. Obviously because in addition to remote data processing, minicomputers allow the penetration of computer technology in virtually all areas of life. This is of course helped by the rapid reduction in the price of minicomputers. In our country, the increase in the

number of minicomputers has accelerated in the past years; our disadvantage, however, even in this area is significant. The proportion of computers operating in the remote data processing mode, in developed capitalist countries, already exceedes 50 percent. Domestically this ratio is about 3-4 percent.

Principal Areas of Application

Mentioning company applications, we can say that the number of companies using computers in the past 10 years developed according to expectation. We must admit, however, that expectations were rather modest.

It is an advantage, however, that today it is becoming more and more common to strive for more demanding applications. In addition to the computerization of the traditional bookkeeping jobs, the majority of the organizations strives for integrated problem solving and data processing to directly support the managerial decisions in planning and management.

In the evaluation of the development level of the enterprise systems we must take into account that their development requires several years even if the purchase and installation of the computer was preceded by careful system organizational efforts. The demands placed on the computer centers must be determined at a distinctive, differential level for a beginner organization, one with 1 to 2 years of experience and several years of experience. Based on this, we can determine whether the general characteristic level of the applications and the efficient utilization of the computers are satisfactory in our country.

This average, however hides rather large inequities. I consider it very significant that we have data on the use and continuous development of 2000 computerized enterprise systems (production control, material and technical support, technical training, transport control, budget and labor management, etc.).

Along with the results achieved, we cannot ignore the fact that the level of many companies is not sufficient for the housing of computer applications.

Among other things, the program set as a goal the development of information systems for four large state administration information bases--OT, PM, KSH and State Administration Computer Service. It determined the budgetary, statistical and planning information tasks. Dealt with the problems of the subsystems to be developed in the framework of the information systems of the State Administration Computer Service portfolios and organs with a national charter, with their effective operation and the development of the coordination necessary for the cooperation of the computer systems in state administrations.

In my opinion, we experienced significant progress in the past years in the area of the computerization of state administration, in the development of all four mentioned and many other state administration information bases.

The designs of computerized automation of technological processes have been developed for several years in our country, thanks to the activities of academic research institutes. Unfortunately, these applications are not widespread. The proportion of scientific technical computations in computer applications turned out as expected, and further rapid development can be expected.

As a whole, during the first 10 years of the Central Computer Development Program, computer applications developed according to expectations and possibilities but in no way according to our requirements. Where in the past years we introduced computers, the established goals and necessity cannot be denied, but the preparations for the applications were not made at the same level, with the same consistency and care. Thus for the sake of the increasing of the economic effectiveness, it is necessary and timely to establish stricter requirements for the preparation and development of application systems.

Training

While, in spite of the unquestionable progress made in the spreading and development of the applications we have numerous problems, we are making good progress in computer training. In accordance with the goals of the program, we created the educational and institutional basis of computer technical personnel training. Within the framework, of the upper level educational institutions and technical training courses, we have implemented our technical personnel training plans. Today 25,000 well qualified computer experts are serving the economy, institutions and enterprises.

The effects of this training program are already noticeable today. The significant increase in the level of expertise in computer applications, due to the institutional and technical training courses and the activities of the computer technological institutes and the institutions controlling the development programs is regarded as an important achievement. This is equally noticeable at the political and state administration organs, companies and social organs both in Budapest and in other areas of the country. The general computer technology culture helps to reduce faulty initiatives and expectations, and sound initiatives become more widespread.

On Contract Work Activity

The computer technology development level of a country is obviously influenced by the number of the contract-work organizations, the nature and level of their activity. Having realized this fact, the program placed a heavy emphasis on the development of contract-work service, and, thanks to this, relatively good results have been shown in this area.

In the past years, about 40 institutes handled the payroll of an external organization whose output exceeded 2.5 billion forints. Among these, there are several organizations whose main charter is not contract work (universities, technical colleges); these merely sell their free machine capacity.

The other branch of paid-work services perform the computational tasks of a single branch or subbranch of an institution or company of the peoples economy.

Finally, the third branch is made up of the computer centers of the national regional paid-work network functioning within the framework of the Computer Technology and Bookkeeping Enterprise, which are available to all branches. Until now, the enterprise has been developing according to the method and pace

dictated by the program of the regional paid-work network. It is presently operating computer centers with a total of 30 computers in Budapest and in 14 county centers.

What Is the Current State of Computerization Like?

Based on the foregoing and adding a few points, I can sum up the current state of somputerization in the following manner.

Relative to the preceding period, the application of computer technology has been accelerated and is better organized. As a whole, the main quantitative objectives set in the program have been achieved, but there is a significant disadvantage in remote data processing, and, at the same time, growth has been larger than expected in the minicomputer category; in spite of all of this, our disadvantage relative to the developed European capitalist countries and to some socialist countries grew based on a specific indicator and as a whole. The use of computer technology penetrated the most diverse aspects of our economic, scientific and cultural life, but unfortunately even some of the largest companies in the country do without or employ only to an unrealistically small degree of computer technology.

The average effectiveness of our computer systems is not bad, but, we have several application systems that are not fully satisfactory but then we have quite a few high level application systems.

Computer technology training has developed within the framework of the program, the regional contract-work network, the research and development institutes and the technical services essentially successfully serve the growth of applications.

The primary objective of the program has been fulfilled, the computer culture has taken roots in our country, and the foundations of a more extensive use of computer technology have been created; our currently active application systems contribute to the increase of the effectiveness of the peoples economy.

In the analysis of the current state of development, the question naturally arises: What are the limiting factors which result in the condition that in spite of all of our efforts in our computerization the positive international tendencies are not realized in all areas, our development rate and the effectiveness of our application systems is lower than expected? Our biggest worry is that the organizational level of our companies and our peoples economy did not and for a while will not permit the rational application of a larger number of computers.

In the era of the current development of the scientific and technical revolution, the typical economic management tool of capitalist countries is computer technology. This is not yet true in our country.

The organization of our economy has not yet reached the level that is the prerequisite of the mass availability of computerized designs. In other words,

prior to the large scale economic use of computer technology, those important organizational tasks must be performed which in the past were not performed at all or were performed at a poor level. At the same time, this demonstrates that if we are successful to continuously implement the organizational tasks included among the goals of the national economy in the 1980s, then the demand for computer technology will probably be increased.

The negative points connected to the application development can be traced back to several subjective causes as well. E.g., the resistance of some economic leaders to computer technology or their fear thereof, and in certain instances, the lack of ability or initiative to learn. During the course of computerization, computers were often turned over to users who were scarcely prepared to accept them; the technical tools and computer technology itself were often blamed for the mistakes caused by the lack of organization and preparation.

This problem area is closely related to the fact that although the program treated the economic aspects of computerization in a comprehensive manner, thus far a systematic and continuous demonstration of economic achievements of computer applications has not been made.

On the Tasks Facing Us

To change the subject to the basic tasks of the coming years, it is obvious that the basic application areas of computer technology, the management of economic units, the computer support of engineering and research projects, the control of production processes and information services will remain significant. Among these, it is important to highlight three areas where a much higher than average rate of development must be achieved.

The first highlighted area is production control. Compared to the domestic use of bookkeeping systems aiding economic management, unfortunately, there is still a very large disadvantage in the area of production control. In this, the regrettable national practice to create complicated technological systems costing many millions or billions and at the same time to "save" what is required for the development of their effective computerized system plays a major role. In this area, beyond the handling of the technical problems, a major change of philosophy is required.

The other area to be intensively developed is the group of information systems and information services. Today the outlines of a large data base are mostly showing in state administration, statistical, budgetary and planning information systems, etc.

By the end of the 1980s, it may be more widely[disseminated], as a services to to the public, e.g., real estate registration, the various health care organizations, National Savings Bank (OTP),meteorological services, information systems of the largest libraries and others. How fast they will spread will, of course, depend, to a large extent, on central decisions and resources.

The third key area is education, the further extension of general and computer technology instruction. One of the most important tasks of the coming decades

is to make the computer technological tools widely available to trained experts with modern computer knowledge, practice and experience. Although there were significant computer technology investments made during the Fourth and Fifth Five-Year Plan periods, the existing tool base must be further developed in accordance with a well thought out plan and at a satisfactory pace. I have mentioned that during the Fourth and Fifth Five-Year Plan the computer centers of the state administration information systems were created. The functioning of this system, however, today is still characterized by a low rate of information exchange; the collection, recording and processing of data are still performed more or less independently. In my opinion, it is reasonable to expect the integration of the state administration computer network to grow and its relationship to the branch information systems be stronger. One of the important elements of the future computer technology infrastructure in the next decade are obviously the enterprises, offices, institutes providing contract-work services. Expectably, the demand for contract work will continue to increase. According to experience, an important part of the preparation for the acceptance of computers is to let a portion of the tasks be performed in advance by contract work.

Thus it is necessary to expand according to requirements of the existing contract work organizations, the national regional network.

But with the widespread use of computers there is a demand today for software services which can supply their users with complex application systems (possibly with organization) or program packages for specific tasks. Such organizations can play a major role in the spreading of typical application systems.

The use of computer technology increases the efficiency of two basic components of production forces, human labor and production tools. In this sense, therefore, computer technology is also an important production force. An indispensable element of the development of the national economy is the automation of management, which promotes the optimal use of the existing resources, the discovery of the hidden resources; it creates new opportunities in the economic and production management of the peoples economy, social and economic control.

A special reason for the further development of computerization is the condition that in the next decades the number of employed will remain practically unchanged. This and the gradually more unfavorable conditions of the peoples economy must be compensated for by an intensive growth in the efficiency of social production. Today and obviously in the coming years, however, the development of the national economy will have a contradictory influence on computerization. On the one hand, since it is a question of a basic tool of social efficiency, it demands more forceful application of computer technology. On the other hand, under the less favorable conditions of social development the investment rates are reduced and this also affects available funds which can be invested in computer technology.

The prognosticated economic growth, taking into account that its prerequisite is an increased level of efficiency, justifies the kind of computerization which increases social efficiency, but, at the same time, pays attention to economic possibilities.

In the coming years, we shall obviously have to deal with a reduced developmental rate and other factors. As I pointed out earlier, the most important among these is the organizational level of our enterprises and that of the entire national economy. Although the elevation of the level of organization is always on the agenda and as a result of steady efforts, an improvement can be expected and experienced, this can only be gradual; thus during the development of our computerization developmental goals, we must take into account the limitations originating in the level of organization.

The application experience of the past period proves beyond doubt that in many cases the very introduction of the computer into the economic unity speeded up and increased the process of organization.

The rational application of computer technology demands order and attention; thus it contributes directly and indirectly to the increase of organization level. This effect must also be considered when the level of organization is examined as a limiting factor.

Based on all these, we must make it clear that for the coming years we can only plan a relatively modest development rate; 1000-1100 operational computers and about 1500 minicomputers by the end of 1985. This, however, cannot mean an equally modest rate of growth in efficiency; on the contrary, the output and the economic efficiency of the shop must increase at a much higher rate than the growth in quantity. This is the most important requirement of the current government program; we must work on this.

The work that must be done in the coming years by the users of computer technology, the promoters of application development and managers is complicated and difficult, but is worth all of the efforts because it serves a good cause: it contributes to the achievement of our social and economic goals, the successful performance of our developmental tasks.

9901
CSO: 2502/19

NEW PRODUCT SPECIFICATIONS OUTLINED

Budapest IPARGAZDASAG in Hungarian No 10, Oct 82 pp 33, 34

[Text] MICROTEST Microprogram Test System

MICROTEST can be used as the effective firmware and hardware test equipment of microprogrammed systems built around bipolar bit-slice MOS microprocessors.

Its basic version contains the following functions:

in-circuit emulation allowing the running of real-time operating speed microprograms with
16K X 8 bits, or
8K X 16 bits, or
4K X 32 bits capacity

tracing of the microprogram to the given processor type

program display/modification

testable program loading from diskette

saving of corrected and tested programs.

The optional expansion possibilities serve for the increase of application scope and user convenience. The optional functions are as follows:

in-circuit emulation up 64 Kbyte capacity with additional storage expansion (the word length can be configured in the 32...26 bit range in 16-bit steps)

microprogram tracing via adapters compatible to further processor types

terminal emulation for the direct access of the ESZR large-machine support of firmware technological aids

matrix printer connection

PROM burn-in connection

TERJE Remote Job Entry Terminal

TERJE is an ESZR compatible terminal supporting the various phases of programming and data processing tasks.

It was built with the application of microprocessor technology; user convenience and easy operation are assured by a 32-Kbyte microprogram.

The terminal can be connected to the data transmission multiplexer or integrated data transmission adapter (R-15 computer) via a 1- or 4-wire physical connection on a 1200 or 2400 baud synchronous data transmission line. The terminal uses the standard BSC data transmission procedure, including the point to point algorithm.

It has two operating modes:

In the off-line operating mode, mostly data preparation tasks can be performed.

In the batch data transmission, it allows the transfer of files prepared earlier in the off-line operating mode to the central computer and the acceptance of list and punched card files.

Software support is in agreement with the support of ESZR batch terminals.

Serves for economical system organization.

Information: telephone number 632-620

M08X Professional Personal Computer

Its hardware and software resources adapted to any task allow the development of a high-output work place. Can be operated in autonomous or intelligent terminal operating modes.

In the personal computer operating mode, under the supervision of a floppy disk based operating system (CP/M compatible), various assembler, FORTRAN, BASIC, PASCAL and C language programs can be developed.

In the terminal operating mode, it can operate as the terminal of various ESZR, MSZR and SIEMENS machines and can access their running program package services.

Its operation requires a knowledge of computer technology which can be learnt in a minimum time.

Its use is supported by continuously expanding program packages, satisfactory for any user demand.

M0X8

in TELEDATA operating mode

DATACROSS screen definition, data collection and information retrieval

DTSEARCH general purpose information retrieval system

TXMASTER text editor and documentation system

BASIC source program preparation

TRANSDATA 8160 based terminal

application in engineering practice

application in agriculture--CADMAS--M--

application in agriculture--feed mixture optimization

module library

as the intelligent terminal of ESZR computers

Information: Telephone number 632-620

TELETERM Programmable Terminal Family Connected to the Telephone Network

The TELETERM terminal is a microprocessor-based, simple and modern dialog-oriented (interrogation) data end device. A relatively simple and inexpensive device performing a desired user task. Its handling and operation requires a minimum amount of technical knowledge. The program housed in it can always be written for the current application requirements.

Some applications areas:

production control

department store and stock room processing

hospital data records

systems requiring quick access, data interrogation or modification in large date bases for taking measures or making decisions and the data must be collected simultaneously from many locations, remote points of the economic production process, far from the central computer.

provides a link to large computers and their services

accessing and input of up to the date information

simultaneously serving and informing many users in a reliable way

opportunity to order detailed information and data media.

Information: telephone 632-607

PRODUCTION OF ROBOTS IN NATION SUBJECT TO DEBATE, DELAY

Budapest NEPSZABADSAG in Hungarian 17, 18 Feb 83

[Article by Katalin Bossanyi: "Machines of the 1980's"]

[17 Feb 83 p 6]

[Excerpt] Experts estimate that the CEMA countries on average are 10 years behind in robotics, but even within this average there are considerable differences. Primarily in the Soviet Union, but also in Bulgaria and the GDR, development began in the mid-1970's on the basis of central programs, modern production bases have been created, and many designs have emerged that are ripe for industrial application. The most significant progress in development has been achieved in the Soviet Union: in 1980, already 3000 robots were in use in various areas of the economy, and their number is to be increased to 120,000 by the end of this decade. This also means an enormous market for the other countries. Lately, Bulgaria has created a significant staff of robots. However, production in larger series and application are still being hampered by the absence of supplier industries. In the GDR, a program to introduce robots began in 1979, on the basis of a government resolution. By 1985, the GDR hopes to produce and employ 45,000 industrial manipulators and robots, which will replace an estimated 110,000 workers. This would be enormous progress!

CEMA Cooperation

The rapid spreading of industrial robots, and the already mentioned bans and restrictions, have prompted closer cooperation among the CEMA countries. Already at the time of preparing the plans for 1980-1985, the Soviet Union proposed the coordination of research and development, and subsequently bilateral agreements on specialization were reached within the CEMA Permanent Committee for the Machine Industry. (Agreements in principle, because series production in most countries will begin only in 1983-1984.) And then last year, at the 36th CEMA session held in Budapest, the member nations signed an intergovernmental agreement that not only marks the start of a new phase in cooperation, but breaks out of the present vicious machine-industry circle and aims for the application of robots in the entire economy. The special committees were to report by the end of last year on the foreseeable demand, and to determine what was already available and what would be worth developing. A new feature of the cooperation taking shape is that it does not wish to strengthen the division of labor with regard to already existing products, but merely wishes to develop specialization in something whose development is in the common interest of several countries. This is why specific agreements, on the basis of analyses, will be concluded only this year.

All this provides an opportunity to review where Hungary stands in the development and application of industrial robots, and whether we will be able to join in the efforts of the other CEMA countries. And how could Hungary benefit from CEMA cooperation.

Although frequent references are being made to it, there is no separate robot program in Hungary. At the start of the plan period, the central agencies were of the opinion that coordination of the just beginning research and development could be solved within the technological development of machine building and in conjunction with the modernization of the supplier industries. This proved to be a farsighted decision, not only in view of the limited resources available, but also because these development projects are truly interdependent and mutually indispensable. To give the infant a name, of course, a Professional Council on Robots (Robot szakmai tanacs) was formed in 1981 within the OMFB [National Technical Development Committee]; and the Ministry of Industry set up a program council (programtanacs) to coordinate the various development projects. The Technological Institute of the Machine Industry has undertaken to coordinate applications, and this is where the program bureau is located. Thus, committees already exist. But is there anything to coordinate?

If there ever is a Hungarian robot, OMFB department head Andras Roth will justifiably be able to claim paternity. This eminent expert has been urging for nearly a decade the development and application of Hungarian robots. In any case, his views are authoritative.

[Answer] In spite of the initial results, Hungary's lag in comparison with the leaders in this field among the CEMA countries can be estimated between 5 and 10 years. Instead of accelerating, this work has slowed down lately. I would like to emphasize that this is not only a question of money. The OMFB even now has an unspent technical development fund for this purpose. Progress is being hampered by different development concepts, but mostly by the little interest among manufacturers and users. In a peculiar way, what we have experienced barely a decade ago in conjunction with the development of N/C machine tools and their controllers is now repeating itself. The central agencies are practically forcing state aid on the enterprises, and they are hesitating. And yet, a delay today will unquestionably mean a lag tomorrow!

[Question] Within CEMA specialization, then, we will not have much opportunity to kick the ball?

[Answer] To the contrary. The agreement provides great opportunities for us. Our advantage lies specifically in our lag. Today we are still able to join any development project without a loss. The modular principle urged by CEMA means that every member nations will realize the joint development projects on the basis of identical supplier industries. In other words, the new robots will be built with unified parts and subassemblies. And here there already are things we could supply.

[Question] Could you cite some examples?

[Answer] We are able to produce modern and economical pneumatic and hydraulic drives, spindles mounted on ball bearings, and also controllers. These products could pay for the robots and subassemblies purchased from other CEMA countries, and for the software that will aid the application of robots. Of course, we should not abandon research and development in areas where we already have results.

Two Extremes

Views still differ as to what would be worth while to completely produce and develop in Hungary. A few enterprises--especially the ones that are users as well as manufacturers--have chosen the tactic of small steps. The Bakony Works (Bakony Muvek), for example, cleverly approached already 10 years ago the immense possibilities inherent in the automation of assembly. By 1985, this plant is planning to start the series production of small transfer manipulators, and of parts-feeding and assembly systems, designed already on the basis of the modular principles. It provides food for thought that, among the enterprises flirting with the robot industry, only this large enterprise in Veszprem has a clear idea of who its future customers will be.

At the MTA [Hungarian Academy of Sciences] Computer Technology and Automation Research Institute (SZTAKI), we find an example of the opposite extreme. Group manager Jozsef Marton demonstrated the American-made Unimate PUMA robot that is being used for experimentation. The clever machine proved to be strikingly "intelligent." It rapidly sorted the light bulbs needed for the Ikarus buses. It set the bad ones aside, and installed the good ones in the headlights. Its "hand" was able to distinguish the forms of objects; and its "eye," their outline. Unquestionably a very impressive performance! However, this costly research direction is identical with the one being pursued in the most developed countries, and only three or four such installations would be needed in Hungary during the next decade. The question unavoidably arises: Is it not an unaffordable luxury for us to engage in such things? The National Technical Development Committee believes that researchers at SZTAKI, with its considerable brainpower potential, can gain valuable knowledge by perfecting the control system and writing the software, and that it will be possible to trade also this knowledge for robots and subassemblies from the other CEMA countries, within the framework of CEMA specialization. In other words, our role will not be limited to that of followers in every field!

Between these two extremes, however, there is a very tangible range that is hallmarked by the development and production that is taking place at the former United Incandescent Lamp (Egyesult Izzo) plant in Gyongyos. The production of transfer manipulators, for use in manufacturing color TV tubes, was begun here in 1976. Such manipulators are not yet robots, but they gave the local experts sufficient exposure to the field to allow them to introduce, on the basis of a Soviet license, the production of robots for loading and unloading presses, and also to develop such robots further. Today there are four or five such robots operating in Hungary. In the meantime, the National Technical Development Committee and the Ministry of Industry came to the conclusion that it was in the long-range interest of this enterprise to adopt and expand this production technology, and therefore United Incandescent Lamp was appointed the base of domestic robot development. In 1981, three large-scale contracts were concluded with this large enterprise. The government was not asking United Incandescent Lamp simply for a favor: it received more than 60 million forints in government aid, a part of it in foreign currency. (The enterprise contributed the same amount). For some reason or other, however, so far the time limits set for development have been met only partially, and the consulting-engineering organization that was to aid the domestic application of robots has not been formed. All this came to light in the course of a recent reorganization.

[18 Feb 83 p 6]

[Text] But why should a reorganization disrupt the development of robots? Because United Incandescent Lamp's machine factory in Gyongyos has been transferred, as of 1 January of this year, to the recently formed Microelectronics Enterprise (Mikroelektronika Vallalat, MEV]. This decision, made in mid-1982, is warranted by the fact that this was where the production of semiconductors and integrated circuits began. In other words, this enterprise is the most important production base for the central developmental program in microelectronics. But the dowry that MEV received proved far more generous: the production structure in Gyongyos includes also robots, in addition to special-purpose machinery of various types.

Factory Swap

It must be admitted that the swap did not come about easily. United Incandescent Lamp would have liked to retain the production of machinery, and MEV was reluctant to assume also the production of machinery and robots, in addition to its diverse developmental tasks. The negotations went on for more than 6 months. Splitting the factory in two also was considered. But, strangely, those who were to be affected the most directly by the reorganization were not consulted. Finally--partially in response to pressure from the local collective--the factory was transferred as a whole. The Microelectronics Enterprise as successor is legally bound to continue also the production and development of robots.

Janos Bito, United Incandescent Lamp's director of development, sincerely regrets the loss of robot production. He related that the enterprise had based its long-range developmental plans also on this product family. Not only as manufacturer, but also as user. The lines for the production of incandescent lamps, the enterprise's most profitable line of business, can be sold in the future only if they are equipped with various transfer and materials handling robots. We have no reason to doubt this, already because even up to now the production of manipulators in Gyongyos has been conspicuously economical. But it is likewise true that whatever has been done here on behalf of robot production can be attributed to the local developers. United Incandescent Lamp merely lent its name.

Istvan Takacs, the chief engineer at the factory in Gyongyos, sums up the situation calmly.

[Answer] The wrangling during the past six months made our specialists bitter and uncertain. Understandably, this has affected also the development of robots.

[Question] What will happen to your previous production of robots?

[Answer] So far, we have shipped more than 400 picture-tube manipulators to the Soviet Union, and there is continuing demand for this product. More recently, we built 130 robots for feeding and checking integrated circuits. The Soviet microelectronics industry would be willing to buy these robots from us in large series. I think that now, after the reorganization, this will be the viable path for us: to link ourselves as closely as possible to microelectronics through, for example, the production of measuring and testing robots.

[Question] And where are you now with the development of the model robot specified in your contract with the government?

[Answer] Progress has been slower than expected, and we will be able to begin foreseeably in 1985 the series of production of more simple robots. Only if there is a demand for them, of course.

And what is the new management's opinion? Ferenc Banyai, technical director of the Microelectronics Enterprise, does not beat about the bush.

[Answer] Once we have fulfilled the international contracts to which United Incandescent Lamp had committed itself, we do not intend to engage in general machine building. We will develop and manufacture robots when economical series production can be based on effective demand.

Technical Trap

Well, these are frank words, although they do contain the well-known technical trap. After all, there can be effective demand for the application of Hungarian robots only if they are first manufactured, and it is customary to start manufacturing only when there are orders. It is also worth considering to what extent is a new organization obliged to continue all of the development projects for which another enterprise had contracted. Especially if along the way the weaknesses of the development projects become apparent. For example, if it becomes apparent that--specifically in the hope of accelerating CEMA cooperation--it is more advantageous to obtain from socialist import the more complicated general-purpose robots that are suitable for a variety of tasks. This circle of questions is further complicated by the fact that so far there has been no financial accounting of the robot development projects between the two enterprises, and the sums involved are by no means small.

Another pending contract concerns applications. Perhaps this issue has aroused passions the most, and differences of opinion are the sharpest here. It is indisputable that an applications bureau, consisting of two dozen young experts, was formed at United Incandescent Lamp in mid-1982. And it is likewise true that their activity has not produced much result. It might be said that this is because the reorganization foiled their expectations. According to the Ministry of Industry, however, there is no need for an applications bureau. Applications are the task of the developer and manufacturer, and this applies also to imported robots.

Examples are cited one after the other. Thus Ikarus itself solves the teaching of its spraying and welding robots. Or the Csepel Machine Tool Factory, in a new experiment, is using Bulgarian robots to service its N/C high-precision lathes. On the basis of foreign experience, however, the OMFB believes that the equipment itself is only half the cost of placing a robot in operation. The other half comprises adaptation to local conditions, special control programs, development of organizational methods, and supplementary equipment. Thus applications are a separate profession, and throughout the world they are being handled by independent engineering bureaus as the general contractors for the software.

The two views could be reconciled, especially if there were more experts with a thorough knowledge of robots, and with the ability to arouse the potential users' enthusiasm. But there is no training in this field in Hungary, technical advertising is still in its infancy, and potential users are of the opinion that application is possible only of what already exists. But there are no Hungarian-made robots as yet, and hardly any information about what the future will bring. In any case it is regrettable that the handful of experts who could truly advance the cause of robot development and applications in Hungary are confronting one another, rather than cooperating.

However, it does appear that in applications the golden median can be found, with a bit of good intention. Professor Laszlo Gribovszki, the director of the Technological Research Institute of the Machine Industry, has this to say:

"We have agreements for cooperation in research and development, with several research institutes in the neighboring socialist countries. In the course of this we have already bought licenses for robots and have monitored them, from production to industrial applications. We are willing to undertake this also in the future. A favorable opportunity for this is being provided by the joint invitation to tender announced by the Ministry of Industry and the OMFB; foreseeably our institute will be entrusted with its coordination. Through 1985, it will be possible to finance from the available 100 million forints the procurement and application of Hungarian-made and imported socialist industrial manipulators and robots. This could provide a considerable incentive."

True. But the announcement of this invitation to tender is being delayed for nearly a year, even though the money for it was available. It seems, at least to outsiders, that the entire robot development and applications program is characterized by indecision, and not only on the part of the enterprises. For example, no review has been made so far of what could be utilized from among the research and development projects in the supplier industries. And this should be the task of the central agencies. In view of all this, one might justifiably ask: Is there a farsighted concept of industrial policy on the domestic development of industrial robots?

According to Andras Gabor, deputy minister of industry, there is.

New Concept

[Answer] I must frankly admit that had you asked me about this a month and a half ago, I would have been embarrassed, because the reorganization confused the picture somewhat. But I see things more clearly now. In my opinion, the bulk of robot development would have had to be transferred from United Incandescent Lamp to another area even irrespectively of the factory's transfer. The earlier development concept must be revised primarily because the world around us has changed. The Microelectronics Enterprise will presumably retain the production and development of various measuring and testing robots, while the new base for the domestic production of robots will be an association that is being set up by the Machine Tool Industry Works (Szerszamgepipari Muvek). Several electronics enterprises that have already been successful in developing controllers and industrial control systems will be members of this association. For example, EMG [Factory for Electronic Measuring Instruments], VILATI [Institute of Electrical Automation], and EVIG [United Electrical Machine Factory]. The various precision engineering enterprises will cooperate as suppliers, and the Technoimpex Foreign Trade Enterprise also will join in the robot venture.

[Question] What will the association be undertaking?

[Answer] The joint production and marketing of simpler general-purpose robots, for which there is a domestic demand as well as a demand in the other socialist countries, and of auxiliary equipment and manipulators that can link special-purpose machines and machine tools into integrated production lines. The supplier industries for this already exist for the most part, and we are also competitive in this field. Only a small precision-engineering manufacturing unit will have to be added to the existing capacities. Since the member enterprises of the association have good foreign connections, we will entrust them also with international coordination.

[Question] What will be the long-term direction of domestic robot development and applications?

[Answer] It will be expedient to base the wider use of robots on multilateral and bilateral cooperation within CEMA. The most advanced are the negotiations with our counterpart agencies in the GDR and Bulgaria, on the exchange of subassemblies, production cooperation, and even assembly. In addition, we have good chances to supply various control elements and program packages also to the other socialist countries. Instead of the domestic development of complete robots, it would be more advantageous to obtain licenses and start joint production. But we will take care not to start too many things all at the same time.

All this appears to be a significant modification of the previous course. And this can be supported also by the fact that the Hungarian enterprises--according to the latest indications and in contrast with earlier surveys--will want mostly simpler robots and manipulators, merely 200 through 1985. What is lacking, of course, is not so much the users' willingness to accept something new. What these figures reflect is mostly the fact that users are facing up to their limitations of their own preparedness to employ robots. For in production the robot cannot remain a "developmental island"; it transforms the technology and demands far more precise work organization, materials procurement and discipline than what is standard practice in the factories today. If for no other reason, this is why we must not forego the application of robots. For they can best reveal our lag, even in comparison with ourselves.

1014
CSO: 2502/22

SERVICES OF SCIENCE ACADEMY INSTRUMENT LOAN SERVICE DESCRIBED

Budapest NEPSZABADSAG in Hungarian 2 Feb 83 p 4

[Article by Pal Gabor Peto: "To Loan or Not To Loan?"]

[Text] "We needed an infrared thermometer," said the manager of equipment service at the Telecommunications Cooperative, "but this kind of measurement does not belong in our profile and every year we require something like this only about twice. The price of the equipment, however, is around 100,000 forints, of course in capitalist currency. Thus we did not buy this kind of equipment, we borrowed it. From whom? From the Equipment and Measuring Instruments Service (MMSZ) of the Hungarian Academy of Sciences. We inquired over the telephone whether they had an instrument like this, and they made a search to see whether such a piece of equipment might exist somewhere but is not in constant use; when they found one, they delivered it to us; they examined it both before and after use, and in this way it cost us much less."

At present the cooperative has borrowed 22 instruments through the MMSZ, and the cooperative itself--it is true--has loaned six.

The MMSZ has a stock of almost 300 million forints' worth of equipment for loan. According to a 1971 KNEB (Central People's Control Committee) study, the degree of use of equipment at the MMSZ is six to ten times greater than that of irregularly used equipment belonging to individual institutions.

But even the equipment pool of such great value is negligible as compared to what is being held at the various research places and operations in the country, a considerable portion of which is used only a small part of the time, while other places would have need for such pieces of equipment but do not own any; they are unable to make the purchase or do not think it worthwhile because they are used so infrequently.

Proceeding from this need, the MMSZ decades ago started the service which they call cooperative loaning. At the order of the Secretary General of the Hungarian Academy of Sciences, the Academy established a free equipment capacity data collection at the expert counseling division of the

MMSZ. The data collection is comprised of those data transmitted by the equipment operations which offer the free examination capacity of their high value, established equipment for use by other institutions.

"For this purpose, our service makes available complete administrative, professional, repair, maintenance, handling, moving and storage apparatus"--they say at MMSZ. "Our superior organs rightfully regard it as extremely significant and important to make better use of this domestic instrument pool that is worth many hundreds of millions. We must remember that the value of instruments declines even when not used, for there is something called worth loss, that is, progress overtakes the equipment, it becomes obsolete and its value declines."

"But it is not merely in recognition of this economic incentive, and unselfishly that the MMSZ performs this activity, is it?"

"No, but this is the activity of ours which brings the least revenue," was the response. "Our revenue from cooperative loaning is less than if we loan our own equipment because only one-third of the loan fee that comes to a monthly 3 percent of the gross value of the instrument is for our service while the rest goes to the organization that makes the loan. Our partners can also negotiate for a greater fee than usual. In 1982, we made 89 million forints on the loan of our own instruments, and scarcely 350,000 on cooperative loaning."

"It is a good deal to borrow instruments through the MMSZ," they say unanimously at most places that borrow. There are no problems, formality or red tape--we inquire by telephone whether the instrument is available. When the loan period is over, they take the instrument, inspect it once more, and if some kind of damage has occurred as a result of the use they make the repairs. For this, of course, they charge the borrower."

"On the other hand, we loan instruments more willingly without going through MMSZ on the basis of personal familiarity. In this way, the loan is less impersonal than via MMSZ: we know whom we are giving it to, who is responsible."

"Under the terms of the loan conditions," they say at the MMSZ, "delivery of instruments is free in the capital city. For delivery to the provinces, the other party does the transporting or pays for the delivery. In the case of instruments of smaller value, it may happen that transportation, maintenance and repair may cost more than what we finally make, but this is balanced out on the average in our loans as a whole, and the loan of less valuable instruments is also an interest of the economy."

"In order truly to "move" the instrument pool of great value, we would need to have a survey of the whole. That is, they should report to us what kinds of instruments they have. The ministries have requested the research places and economic units in writing to report their instruments, but they reported only a few, or for the most part those in bad or unusable condition. We did not receive a single reply from the units belonging to the Ministry of Industry! It was relatively the Ministry of Education that best met the requirements of the instructions."

"We do not think that any of our partners have a cause for complaints--we assume every task that we can, including material matters, accounting, contract signing and transfer. And still, cooperative loaning is not a going business. But we can activate in this way enormous unused values, and everyone will benefit, most of all the economy. But so will the individual users, particularly if we consider the present investment and purchasing limits which may be expected to continue for some time.

"The interest of those making the loans is not clear. This is the main obstacle to a very profitable activity."

"Let us speak frankly," they say at research places, enterprises and so forth where only few loans are made. "What is our interest, our incentive in this?" We understand that the economy would have an interest in seeing that our instruments could be used by others, when we ourselves do not need them. But what about us?"

"For example, if we need an instrument urgently, we cannot get it back immediately. Moreover, how can we know how the borrower will use it? Obviously, he will want to get everything out of it that he can for the money. This is understandable. But what if something breaks down. The MMSZ, of course, will repair it if they have the part. But what if they don't, which is not rare in the case of instruments from capitalist countries? Then an instrument of great value sits there idle because of the lack of a part that costs several hundred or even only several forints.

"But you are paid for the loan!"

"Well, here's the rub. We do not get much but this is not important. It is important though that what we receive in return and our expenditures we can book only as costs. That is to say, while they are using our instrument which we purchased mostly for foreign exchange and at the cost of our development fund, we receive forints in return, and in addition forints which we cannot apply to compensating the value depreciation of our instrument pool. If we could only use the sum of money received in this way for development! Then we would ransack our place to see what kind of instruments we have that we could loan. But in this way? We would rather let them stand unused; even though they depreciate in value, they are at least available to us when needed.

The above debate which did not take place and the arguments and counter-arguments which I heard on one hand from the MMSZ and on the other hand from the lenders makes it clear why instruments are not reported, why the expensive imported instruments and pieces of equipment are not given out on loan. The reason is that the institute and enterprise interests are contrary to those of the economy, which is served by the MMSZ. But without a counterbalancing interest, it cannot secure validity for this interest.

The compromise of interests must now be the tasks of other organs.

6691
CSO: 2500/20

AGRICULTURAL MACHINE FACTORY MAKES ROBOTS

Budapest MAGYAR NEMZET in Hungarian 22 Feb 83 p 9

[Text] A dual-headed, program-directed welding robot has been constructed and put into operation by the Rekard Agricultural Machine Producing and Servicing Enterprise of the city of Gyor. The device welds two parts per head simultaneously and requires only one person to operate it. When the robot is run in three shifts, the work of two welders and a feeder become unnecessary per shift. The costs of the robot are expected to be realized within a year.

The enterprise's own technical staff also designed and fabricated a feeding and calibrating robot. The former device feeds the work piece to the welding robot and removes it after completion of welding. The calibrating robot takes precise measurements of the parts before they are assembled and indicates any deviation from specifications.

At present these developments in robot engineering are being used solely by the enterprise, but it is conceivable that the machines will be produced for sale in the future.

CSO: 2502/27

DESIGN, OPERATION OF INDUSTRIAL ROBOTS DESCRIBED

Warsaw POLISH ENGINEERING in English No 1, Jan 82 pp 20-21

[Text]

INDUSTRIAL ROBOT

IRb 60 (ASEA licence)

replaces expensive specialized machines. Its universality enables realizing of the following processes: welding, bending, grinding, edge blunting and polishing as well as transfering and shifting of the manufactured parts.
The universality of robot IRb 60 is testified by following programming possibilities:

- point controlling at programmed speed
- line controlling assures the programming of curves at programmed speed
- searching function at line controlling enables holding the manufactured parts from pallets of different height
- step function enables simultaneous services of unsynchronized machines
- repeating function enables programming of multiple repeating of each programs' fragment
- pattern function facilitates programming of collection and arrangement of manufactured parts according to a definite pattern
- correction function allows, by simple changing of existing programs, to cancel or to complete them
- controlling of machines and equipment served by robot:

Control circuit can cooperate with programmed 16 entries and 14 exits. Owing to big memory capacity of robot IRb 60 and its controlling possibility, production center may be operated without any service for definite period of time. Its container has to be loaded in the evening and the manufactured products are to be taken in the morning. In western countries this robot may be sold only as part of production Units, as for example: robot + welder, robot + machining center, robot + grinder, etc.

TECHNICAL DATA

Number of steps of freedom	3–5	
Highest load	600 N	
Positioning precision	± 0.4 mm	
	Highest displacement	Highest motion velocities
– turning around the base	330°	90°/s
– turning of lower arm from	+50° to −20°	1 m/s
– joint raking from	+10° to −55°	1.3 m/s
– turning of upper arm from	+75° to −120°	90°/s
– joint twisting	±180°	150°/s
Supply	electric	
Control system	by microprocessor	

INDUSTRIAL ROBOT
RIMP-1000

replaces a man under harmful working conditions mainly at:

- large temperature fluctuations
- dusty or toxic atmospheres
- high or low frequency vibrations

RIMP 1000 is able to manipulate a tool during:

- welding and thermal cutting
- resistance welding
- loading and unloading of devices
- pressure casting
- plastics processing
- deposition of special coatings
- interoperational transport
- simple mounting operations

TECHNICAL DATA

Number of steps of freedom		3 – 6
Highest load		600 N
Positioning precision		± 1.5 mm
	Highest displacements	Highest motion velocities
– arm sliding	800 mm	0.75 m/s
– arm turning	220°	110°/s
– arm lifting	57°	110°/s
– head bending (bow)	220°	110°/s
– head twisting	200°	110°/s
– head turning (sixth step of freedom)	300°	110°/s
Coordinates of working motions		polar
Control system		computer system PTP
Programming system		teaching
Supply		
– pneumatic		0.3 ÷ 0.7 MPa
– electric		3 × 380 V, 50 Hz

INDUSTRIAL ROBOT
PRO 30

has been designed for operational and interoperational transport of parts during their machining on machine tools or other technological equipment. In a standard version, robot PRO 30 is produced without holder, but hydraulic and electric installations of the robot are able to be adapted for the cooperation with single or double holder designed for shafts of diameters 16 ÷ 160 mm and for disks of diameters 150 ÷ 350 mm. Working cycle of the robot is to be established by teaching i.e. hand controlling of robot motions realizes its succesive characteristic points of working cycle. The coordinates and succesion of these points are automatically introduced into memory of controlling circuit.

TECHNICAL DATA

Number of steps of freedom	4
Nominal load	300 N
Positioning precision	± 0.4 mm
Lifting height range of forearm	730 ÷ 2160 mm
Acting radius range of forearm	1100 ÷ 1760 mm
Motion ranges and their nominal duration:	
– column turning	360°/5 s
– main arm turning	60°/2 s
– forearm turning	60°/1 s
Turning drive	electromechanical
Holders grip	hydraulic

INDUSTRIAL ROBOT
RIMP 401

replaces the workers in transport operations as well as in loading and unloading of manufactured parts during production processing. Taking in account manipulation ability of the robot it may be especially effective in servicing of:

- presses for cutting, bending and punching metal elements
- presses for metal forming
- machines for pressure casting and injection moulding
- induction hardening equipment
- forge hammers
- interoperational transport equipment

Indisputable advantages of the robot RIMP 401 are: durability and reliability as well as great precision repeatability, large versatility of types for variety of applications (one- and two-arms, stationary, transportable, with different arm sliding), and possibility of the usage of manipulating parts in agressive environments i.e. higher temperatures, vibrations etc.

TECHNICAL DATA	
Number of steps of freedom	4
Highest load	40 N
Highest working radius	1380 mm
Motion ranges and their nominal duration:	
– column turning	120°/1.0 s
– column lifting	140 mm/0.5 s
– column lowering	140 mm/0.6 s
– arm sliding	600 mm/1.0 s
– arm removing	600 mm/1.2 s
– holder turning	180°/0.3 s
Positioning precision	± 0.3 mm
Control system	computer type PTP
Programming system	diode matrix
Supply	
– pneumatic	0.5 MPa
– electric	220 V, 50 Hz

CSO: 2020/19

NEW DRUG 'RODILEMID' BEING TESTED AS ANTIVIRAL AGENT

Bucharest STIINTA SI TEHNICA in Romanian No 10 Oct 82 p 29

[Article by Dr. Romulus Dinu]

[Text] At the second international conference "Water and Ions in Biological Systems," held in Bucharest from 6-11 September and organized under UNESCO sponsorship by the Academy of Medical Sciences and the Union of Societies of Medical Sciences in the Socialist Republic of Romania, the Romanian Society of Biophysics and the International Union of Pure and Applied Biophysics, a very interesting paper was presented for the first time: "Chelatotherapy in Some Neuroviroses." The paper was presented again at the Danubian Symposium of Neurology held in Bucharest early in October.

The paper, a synthesis of a tireless research activity conducted for about 30 years by neurologist Romulus Dinu, doctor of medical sciences, and Ileana Dinu, chief scientific researcher, doctor of chemistry, is a major Romanian discovery. Indeed, Rodilemid, the drug developed by the two specialists, is the world's first antiviral agent which is effective in treatment of neuroviroses, severe diseases, which often are disabling, and are similar to disseminated sclerosis.

Dear readers, you are invited to retrace -- with the authors -- the stages of this difficult, but full of promises, journey.

Suppressing Viral Activity Without Harming the Host Cell

By "chelatotherapy," a term which we have figured to define a chapter of pharmacology and therapeutics in the immediate future, we mean treatment by chelators, substances capable of "chelating," of gripping in a claw (chela is claw in Greek) the metals in the biological media and in cells) and of eliminating them (presumably, selectively) through the kidneys. Hence, the chelators are capable of blocking the metal ions needed for the activity of some enzymes involved in the multiplication of viruses, consequently becoming antiviral agents.

Research in this area has been of a long standing and recently has been extensive. In 1950 Hamre indicated that a thiosemicarbazone, a strong chelating agent, is active in the infection with vaccine in mice. Other compounds in this chemical class have proved to be active in the treatment of variola in an epidemic in Madras. In this country, G. D. Grigorescu noted and wrote in 1955 that dimercaptopropanol (DMP) is active in zona zoster. In a monograph by D. D. Perrin and H. Stunzi published in

December 1981 there are no less than 271 bibliographical items on antiviral chemotherapy with metal ions and chelating agents. However, all are laboratory studies on tissue cultures or small animals. In humans, a chelator was tested -- unsuccessfully -- in the form of nasal spray, as a preventive agent in influenza.

We have been concerned with finding an antiviral agent in neuroviroses for almost 30 years. Therefore we were not satified with the results obtained by G. D. Grigorescu, from DMT, a toxic chelator, with the active dose of 2-3 mg per kg/body being very close to the toxic dose. Moreover, also other antiviral agents, such as thiosemicarbazones, adeninearabinozide, cytozinearabinozide, isoprinosin, and the like, found commercially, are only seldom used because of their toxicity. The principle of treatment in viroses is to suppress viral activity without harming the host cell. That is what Romanian Rodilemid is successfully doing today.

Several years ago we tested a Romanian chelator, used as an antidote in heavy metal poisonings, whose advantage involved its being free of toxicity. The succes in treatment of zona zoster increased considerably: eruption vanishes in a few days in 100% of cases, and the pain disappears concomitantly. In the cases -- few in number -- where pain persists after discontinuation of the treatment, its swift disappearance is obtained by a few intradermal shots with xyline in the painful areas. This was the first stage.

Considering as very important the antiviral role of the Romanian product we extended our tests to other neuroviroses which affect the cranial nerves: facial paralyses, optic neuritides, paralyses of the oculomotor nerves. The results were encouraging but the need was felt for improving the product. It was at this point that my wife, Dr. Ileana Dinu, stepped in. As a chemist, she had the idea of adding to the first chelator -- a strong multidented agent -- a weaker chelator, whose role was to increase, not arithmetically, but exponentially, the first agent's capacity of fixing the ions, that is by a factor of 6 up to 16 (we, also, do not know exactly for now). In this way we have obtained what today is called RODILEMID ^{R}, turned out by the Bucharest Industrial Center for Pharmaceuticals and patended under No 79426 of 23 February 1982.

Multiple Sclerosis, "The Diseases With a Thousand Faces"

With Rodilemid we dared -- the first in the world -- to attack one of the most severe disorders of the nervous system: diseeminated sclerosis or multiple sclerosis, which is included in the group of diseases called leuconeuraxities. It is certain that multiple sclerosis sets in as a neurovirosis, but the fact that the attacks of paralysis which affect with intermittence and increasing persistence the patients' condition, going as far as disability, are or are not due to the initial virus, which periodically resumes its activity, no longer is certain. The system's own substances produced in the inflammatory processes may become the factors of immune autoaggression.

The first results obtained with Rodilemid were quite unexpected. We obtained total or significant remissions of paralyses, which amazed us more than the patients, who have been expecting -- with good reason -- for so long the development of a drug for their ailment too.

Multiple sclerosis, "the disease with one thousand faces," operates differently in various patients, according to the way in which the virus has disseminated its

attacks in the entire nervous system, from the brain to the spinal fluid. So far, corticotherapy induced improvements which were more or less significant and had a variable duration. But the treatment with corticoids is long and double-edged, causing many drawbacks. Remissions in multiple sclerosis also occur without treatment. Statistics involving hundreds of cases (J. F. Kurtzke), which are unanimously accepted, indicate that if the patient begins any treatment between 1-7 days from the onset of the attack, remission is noted in 87% of the cases; between 8-14 days -- 64%; between 15-31 days -- 38%; from 1 month to 1 year -- 17%; from 1 year to 2 years -- 7%; 2 years after the onset of the attack -- 0%.

Our rough data -- when we practically had only cases presented 1 month and 1 year after the onset of the attack -- shows us a proportion of remissions, major or notable, of more than 90%. A comparison with Kutzke's statistics is telling. These remissions are obtained in 6 up to 10-15 days, most of them in 5-6 days, thus excluding the idea of a "spontaneous" remission of the disease. We do not yet have the time perspective because our discovery is recent. However, for several months now the results obtained have been constant. In 2-3 cases with a slight tendency to relapse (especially after exposure to the sun, an absolute contraindication in multiple sclerosis) a remission of the disease was noted as early as after the first doses. A very essential specification: we are obtaining remissions only in the attacks in relatively recent cases (1-7 years), without definitive lesions of nervous formations; the old, latent, serious cases do not benefit from the treatment.

Rodilemid also has a facilitating action for the passage of the nervous influx and also an anti-inflammatory and trophic action. The facilitating action results, in rare old and serious cases, in improvements that last as long as the treatment is applied. Explanations exist. But when the lesions are serious only apparently, inducing paralyses, the antiviral, facilitating, anti-inflammatory and trophic actions combine and result in long remissions of the paralyses.

In perspective, we feel that early application of the Rodilemid treatment, immediately after the disease was diagnosed, will prevent the onset of disabling paralyses; even if the patients will still present slight attacks, these will be improved with a few doses of Rodilemid.

I believe that before concluding the series on neuroviroses treated with this drug I must add that also certain diseases of animals, such as Carre's disease (mange), that also was declared lethal in 95% of the cases, benefit from chelatotherapy. The tests were conducted successfully at the clinic of contagious diseases of the Faculty of Veterinary Medicine.

We make a point of emphasizing the significant support of the National Council for Science and Technology, immediately after learning about our surveys, and of the Industrial Central for Pharmaceuticals, that prepared our drug. The Commission for Drug Control fairly rapidly gave its agreement for the verification of our drug to be made in specialized clinics (neurology, dermatology). We are certain that we will be confirmed but the appearance of the drug in pharmacies will take a litle longer. The product must take the usual path of verification and approval. Until then the patients with attacks who want to use the drug must apply to the Bucharest clinics of neurology, where the Commission for Drug Control will send the vials required for its verification.

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